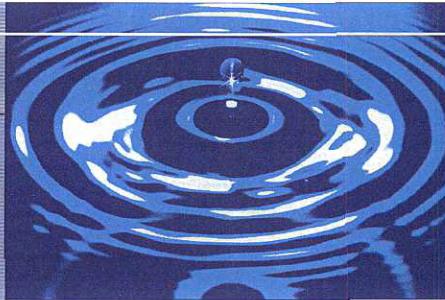


APPENDIX K
Stormwater Management Plan



Storm Water Management Plan (SWMP)

Project Identification:

Peaceful Valley Ranch

GPA 03-05 / R 03-015 / TM 5341 RPL⁵ / MUP 04-048
Log No. 88-19-002A

Applicant:

Peaceful Valley Ranch LLC
14131 Hillside Drive
Jamul, CA 91935

Contact Person: Streeter Parker
619-669-0600 telephone / 619-669-6558 fax

SWMP Prepared by:



RBF CONSULTING
9755 Clairemont Mesa Blvd. Suite 100
San Diego, California 92124-1324
858.614.5000 telephone / 858.614.5001 fax

Contact Person:

Marc A. Schulte, RCE 60627, CPSWQ 0192
Alex Jewell, AICP

RBF JN 25-100796

Initial Preparation Date: June 12, 2006

Revision Date(s): 08/30/06 - Transition Previous SWMP to 2005 SWMP Template
07/24/07 – Revise Attachment D

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NOTE: Engineer's stamp and signature found in Attachment G.



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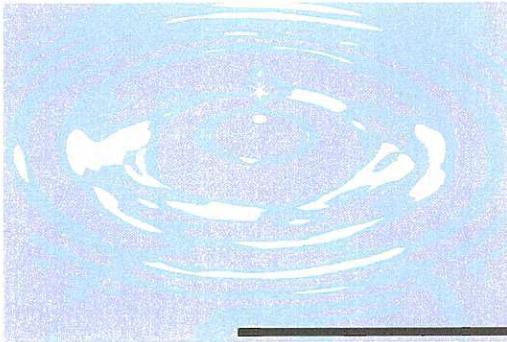
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LIST OF ATTACHMENTS

Attachment A	Location Map (Reference Thomas Bros. 1292-J3)
Attachment B	Project Site Map
Attachment C	Water Quality Monitoring Data
Attachment D	Treatment BMP Location Map
Attachment E	Treatment BMP Data and Sizing Calculations
Attachment F	Treatment BMP Maintenance Program
Attachment G	Engineer's Certification

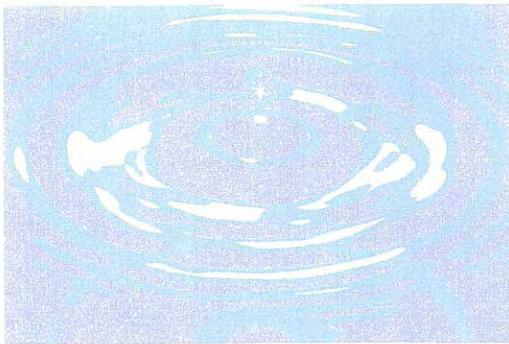
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INTRODUCTION

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9424) requires all applications for a permit or approval associated with a Land Disturbance Activity must be accompanied by a Storm Water Management Plan (SWMP) (section 67.804.f). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority project are required to prepare a Major SWMP.

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1 Project Description

This section describes the project with respect to its location, the planned improvements, and places it within the context of the larger watershed.

1.1 PROJECT LOCATION

The project site is located in the community of Jamul in San Diego, California. The project is located just east of SR-94 (reference Thomas Bros. 1291-J3). Attachment A provides a location map for the project.

1.2 PROJECT DESCRIPTION AND PURPOSE

1.2.1 Project Description

The Peaceful Valley Ranch project proposes the subdivision of 181.31-acres for an estate residential development, equestrian uses and amenities, and fire service facilities. The development plan includes a total of 57 lots consisting of:

- a) 46 – new estate residential lots ranging in size from a minimum of 2-acres up to approximately 7.7-acres (Lots 1-4, 6-47);
- b) 1 – estate residential lot of 4.0-acres for the existing Ranch House (Lot 5);
- c) 1 - 6.7-acre equestrian facility lot (Lot 48);
- d) 1 - 3.7-acre lot reserved for a new joint-use fire station and administrative offices of the RFPD and US Fish and Wildlife Service (Lot 49);
- e) 1- open space lot (3.7 acres) for the protection of biological resources (Lot 50);
- f) 1 -28.9 acre private horse stable and training facilities / polo field lot (Lot 51); and,
- g) 6 - private roadway lots (Lots 52-57).

1.2.2 Project Activities

The public equestrian facility (Lot 48) will include several barns to accommodate up to 30 horses, several small paddocks for daily horse turnouts, and an arena with jumps for training and horse show purposes. The private facility (Lot 51) will be developed as the Peaceful Valley Ranch Training Facility and Polo Field, an agribusiness for boarding, training, and selling polo horses. The private facility will include several barns to accommodate up to 48 polo ponies, paddocks for daily horse turnout, and a regulation size polo field. Because of the equestrian facilities, activities on the site will generate some food and animal waste products.

The 3.7-acre lot on the west side of the site (Lot 49, adjacent to SR-94), is proposed for joint use by the Rural Fire Protection District (RFPD) and the United States Fish and Wildlife Service (USFWS) as a future site for relocation of the fire station and administrative offices.

The proposed Peaceful Valley Ranch (PVR) project will also feature a trail system that traverses the site. A main feature of the trail system will be it's routing adjacent and parallel to the main on-site drainage. The trail system will provide opportunities for recreational walking, hiking, and equestrian uses and will allow for future linkages to off-site trails at the northerly and southerly property boundaries.

1.2.3 Permit and Zoning Requirements

The project also includes a General Plan Amendment (GPA) to amend the existing land use designation of the easterly 152.4-acres of the 181.31-acre property from (18) Multiple Rural Use (1 du/4,8,20 ac) with an A72 (8) General Agriculture zone, to the (17) Estate Residential (1 du/2, 4ac) designation with an A72 (2) General Agriculture zone. The General Plan Amendment covers APN's 597-050-13, 597-070-02, and 597-070-07. The GPA request also seeks removal of a segment of a County of San Diego Circulation Element Road, SC 760, which is currently aligned through the project site. SC 760 is a planned two-lane Light Collector Road. The segment of SC 760 proposed for removal with the project extends from SR 94 north to Olive Vista Drive. The project includes the annexation of 152.46 acres of the easterly portion of the site into the San Diego County Water Authority and Metropolitan Water District.

A Tentative Map for the Peaceful Valley Ranch project is also part of this development proposal. The project proposes the subdivision of the 181.31-acre property as described above.

1.3 EXISTING IMPROVEMENTS AND DRAINAGE PATTERNS

1.3.1 Existing Drainage Improvements

The watershed generally drains from north to south. Two Unnamed Tributaries to Jamul Creek (one running north-south and the other running east-west) run through the middle of the project site and there are numerous feeder streams within the watershed. Because the majority of the watershed is undeveloped, there are few storm drain facilities present. Drainage paths through the low-density residential areas are typically accomplished via natural streams, open channels/ditches, and overland flow. Occasional culverts are used to convey flows from one side of a road to the other.

Off-site facilities include an existing 60-inch culvert at Melody Road at the northwest corner of the project site. There is also a 30-inch culvert under Campo Road (SR-94), and a 12-inch culvert under Campo Road near the existing driveway at the proposed fire station site.

1.3.2 Floodplain Mapping

The Federal Emergency Management Agency (FEMA) has not mapped any Special Flood Hazard Areas (SFHAs) for the Tributary to Jamul Creek on the project site. The watershed analysis prepared in support of this project calculates the peak 100-year discharge in the Tributary to Jamul Creek immediately downstream of the project limits

as 4093 cfs. The inundation area corresponding to this peak discharge has been analyzed and noted on the Tentative Map and Preliminary Grading Plan for the project.

1.3.3 Downstream Conditions

RBF Consulting performed a field visit on May 6, 2003 to examine the project site. In this area, Jamul Creek Tributary appears to be an ephemeral stream with mild amount of sedimentation, perhaps due to bank sloughing. At the time of the field visit, the banks were well vegetated and relatively stable. Some concrete debris was noted in the channel.



Figure 1-1 Existing Channel of Jamul Creek Tributary on Project Site (May 2003)

1.4 PROPOSED IMPROVEMENTS AND DRAINAGE PATTERNS

The proposed facilities managing runoff from the site include:

- Appropriate grading of pads to direct runoff away from structures on the site.
- Storm drain systems to direct on-site runoff to appropriate outfalls.
- Vegetated swales that will intercept runoff for treatment before directing the discharge offsite.

1.5 HYDROLOGIC EFFECT OF PROJECT

The site has little impervious cover under the existing condition. The project will add approximately 16 acres of impervious area to the project site. This estimate assumes that each residential unit will contribute 7500 square feet of impervious area, and that there will be approximately 9300 linear feet of 32-foot wide access roads. Based on preliminary information, the analysis estimates five equestrian barns of 7680 sf each. The impervious area associated with the construction of the fire station on SR-94 is not part of the current analysis. **Table 1-1** summarizes the impervious cover under existing and proposed condition.

Table 1-1 Summary of Impervious Cover Analysis

Coverage	Existing Condition (acre)	Existing Condition (%)	Proposed Condition (acre)	Proposed Condition (%)	Change (acre)	Change (%)
Impervious Area						
Residential Buildings*	0.17	0%	8.78	5%	8.61	+5%
Equestrian Facilities**	0.00	0%	0.88	0.5%	0.88	+0.5%
Paved Area***	0.23	0%	6.83	4%	6.60	+4%
Subtotal Impervious Area	0.40	0%	16.49	9%	16.09	+9%
Pervious Area						
Landscaped Area	0.00	0%	0.00	0%	0.00	0
Unimproved Area	180.90	100%	164.81	91%	-16.09	-9%
Subtotal Pervious Area	180.90	100%	164.81	91%	-16.09	-9%
Total	181.30	100%	181.30	100%	0.00	0

*Assume 7500 sf per residential unit; ** Estimate 5 barns at 7680 sf for equestrian facilities;

*** Assume 9300 lf of 32 ft wide roadway; Note: Fire station construction is not included in the impervious area analysis.

1.6 HYDROLOGIC CONTEXT (WATERSHED CONTRIBUTION)

The project site is located on the 7,795-acre (12.2-square mile) Jamul Hydrologic Sub-Area (HSA 910.33), which is part of the Dulzura Hydrologic Area (HA 910.30) and Otay Hydrologic Unit (HU 910.00). The 181.3-acre project accounts for approximately 2 percent of the local watershed area. Table 1-2 compares the project site to the local watershed area. Attachment B illustrates the project site in the context of the watershed.

Table 1-2 Comparison of Watershed Areas

	Area (acres)	7,795	181	15.6
Jamul HSA 910.33	7,795	100%	-	-
Property	181	2%	100%	-
Impervious Area (Estimate)	15.6	< 1%	9%	100%

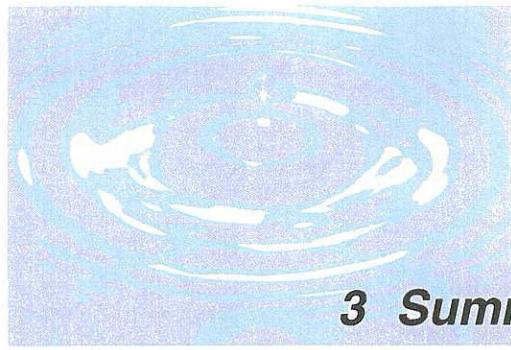


2 Priority Project Determination

The following table determines whether the project is priority according to guidelines laid out in the Municipal Permit. There is a limited exclusion for trenching and re-surfacing work associated with utility projects, which are NOT considered priority projects. Parking lots, buildings, and other structures associated with utility projects are subject to SUSMP requirements if one or more of the criteria described in the table are met. Answering NO to all the projects indicates that the project is NOT a priority project and it is not necessary to complete a Major SWMP. Rather, a SWMP for Minor Activities must be completed.

PRIORITY PROJECT	YES	NO
Redevelopment within the County Urban Area that creates or adds at least 5,000 of net square feet of additional impervious surface area.	✓	
Residential development of more than 10 units.	✓	
Commercial developments with a land area for development of greater than 100,000 square feet		✓
Automotive repair shops.		✓
Restaurants, where the land area for development is greater than 5,000 square feet.		✓
Hillside development, in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 square feet or more of impervious surface	✓	
Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition.	✓	
Parking Lots 5,000 square feet or more or with 15 parking spaces or more and potentially exposed to urban runoff.	✓	
Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater.	✓	

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3 Summary of Water Quality Issues

This section provides a summary of relevant storm water quality issues pertaining to the project site.

QUESTIONS	Section	Completed	N/A
Describe the topography of the project area.	3.1	✓	
Describe the local land use within the project area and adjacent areas.	3.2	✓	
Evaluate the presence of dry weather flow.	3.3	✓	
Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	3.4	✓	
For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	3.5	✓	
Determine if there are any High Risk Areas (municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits.	3.6	✓	
Determine the Regional Board special requirements, including TMDLs, effluent limits, etc.	3.7	✓	
Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	3.8	✓	
If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	3.9	✓	
Determine contaminated or hazardous soils within the project area.	3.10		✓

3.1 TOPOGRAPHY

The topography of the site is quite complex. Except for a minor part (approximately 12 acres) that drains south and west towards SR-94/Campo Road, the site generally drains from north to south. A ridgeline, located approximately through proposed Lot 45 through Lot 4, divides the property into two parts. Approximately 24 acres are west of this ridgeline. The highest point of this part of the property is located near proposed Lot 45, at an elevation of approximately 1028 feet MSL. This part of the property drains south over a distance of approximately 1600 feet to an elevation of approximately 828 feet MSL for an average grade of approximately 7.5 percent. The remaining part of the property (approximately 145 acres) is east of the ridgeline. The highest point of this part of the property is located to the northeast, at an elevation of approximately 1100 feet MSL. This part of the property drains south over a distance of approximately 3200 feet to

an elevation of approximately 830 feet MSL for an average grade of approximately 8 percent.

3.2 LAND USE AND VEGETATION

The project site is currently used for agricultural purposes and private residences. Rural residential land is located to the west, north, and east of the project site. There is agricultural acreage to the southwest of the property. The California Department of Fish and Game manage an open space parcel to the south of the project site.

A large portion (approximately 108 acres) of the site is classified as agricultural land. There are significant acreages of grassland (approximately 25 acres) on the lower parts of the site, and coastal sage scrub (approximately 29 acres) located on the upland parts of the site. There are minor amounts of eucalyptus and riparian woodlands along the stream corridor.

3.3 DRY WEATHER FLOW

No dry weather flow was observed in Jamul Creek Tributaries during RBF Consulting's field visit on May 6, 2003. In this area, Jamul Creek Tributary appears to be an ephemeral stream with mild amount of sedimentation, perhaps due to bank sloughing. At the time of the field visit, the banks were well vegetated and relatively stable.

3.4 RECEIVING WATERS

Construction, operation, and maintenance of the project will affect receiving waters throughout the project lifetime. The most immediate receiving waters for the project site are the Unnamed Tributaries to Jamul Creek that run through the project site.

According to the California 2002 303(d) list published by the San Diego Regional Water Quality Control Board (RWQCB Region 9), none of the immediate receiving waters for the site are impaired for any pollutants.

Table 3-1 Summary of Receiving Surface Waters

Receiving Water	Hydrologic Unit Code	Approximate Distance From Site	303(d) Impairment(s)
Otay Hydrologic Unit (910.00)			
<i>Dulzura Hydrologic Area (910.30)</i>			
Un-Named Jamul Creek Tributary (Jamul HSA)	910.33	-	NONE
Lower Otay Reservoir (Dulzura HA)	910.31	5 mi	NONE
<i>Otay Valley Hydrologic Area (910.20)</i>			
Otay River (Lower Otay River HSA)	910.21	8 mi	NONE
San Diego Bay (Lower Otay HSA)	910.20	18 mi	NONE

The most immediate receiving water for the project site are the Unnamed Tributaries to Jamul Creek. Jamul Creek flows to the Lower Otay Reservoir, the Otay River, and ultimately to San Diego Bay. According to the California 2002 303(d) list published by the San Diego Regional Water Quality Control Board (RWQCB Region 9), none of the

receiving waters for the site are impaired for any pollutants. However, the fact that the Lower Otay Reservoir is used for drinking water supply should be given consideration in the water quality effect analysis. Table 3-1 summarizes the receiving waters and their classification by the RWQCB Region 9.

3.5 303(D) IMPAIRMENTS

The Environmental Protection Agency (EPA) is the primary federal agency responsible for management of water quality in the United States. The Clean Water Act (CWA) is the federal law that governs water quality control activities initiated by the EPA and others. Section 303 of the CWA requires the adoption of water quality standards for all surface water in the United States. Under Section 303(d), individual states are required to develop lists of water bodies that do not meet water quality objectives after required levels of treatment by point source dischargers. Total maximum daily loads (TMDLs) for all pollutants for which these water bodies are listed must be developed in order to bring them into compliance with water quality objectives.

The project does not discharge directly into any water bodies listed as impaired on the 303(d) list.

3.6 RISK ASSESSMENT

There are approximately five existing groundwater wells on the project site. Two of these wells will remain available for domestic water supply for existing residences, though municipal water connections will also be available to these sites. The remaining wells will be either de-commissioned or used exclusively for irrigation of the polo grounds, and not for drinking water supply. Therefore, *there are no high-risk drinking water supply or other sensitive resources within the project limits.*

3.7 TOTAL MAXIMUM DAILY LOAD (TMDL)

There are currently no Total Maximum Daily Load (TMDL) restrictions for the project receiving waters.

3.8 GENERAL CLIMATE

San Diego climate is classified as Mediterranean, with warm, dry summers and mild, wet winters. Annual precipitation averages range from 10 inches along the coast to 18 inches the eastern mountains, with low to high intensity storms occurring mostly in the winter and spring.

The average annual precipitation for the watershed area is approximately 12 inches. The 6-hour, 100-year design precipitation for the project site is approximately 3.1 inches, with a maximum 10-minute intensity of 5.2 inches/hour. Figure 3-2 describes the rainfall intensity curve for the project site.

3.9 SOIL CHARACTERISTICS

No soils report has been prepared at this preliminary stage of the project. Therefore, the Soil Survey for the San Diego Area by the Soil Conservation Service (1973) forms the basis of this discussion.

Soils on the project site have only moderate to low permeability and are almost all considered to be severely erodible. The Soil Survey indicates that there are a variety of soils present on the site. Approximately 86 percent of the project site consists of SCS Hydrologic Soil Type C, primarily in the form of Ramona and Fallbrook Sandy Loam soils. There is an area of Hydrologic Soil Type A soils located along the streambed in the central part of the site. Almost all the soils on the project site are considered severely erodible. Table 3-2 and Figure 3-1 summarize the soils on the project site.

Wieldlin and Associates (June 2006) evaluated the potential for high regional water table interference with proposed septic leach fields for Peaceful Valley Ranch. The analysis concluded that peak *groundwater table levels are generally more than 13 feet below ground surface, with the exception of higher groundwater table (less than 10 feet below ground surface) along the flowline of the Jamul Creek Tributaries on the site.* Groundwater table elevation will not be an issue for BMPs such as vegetated swales, but will need to be accounted for in the final engineering of the proposed bioretention area near the polo field.

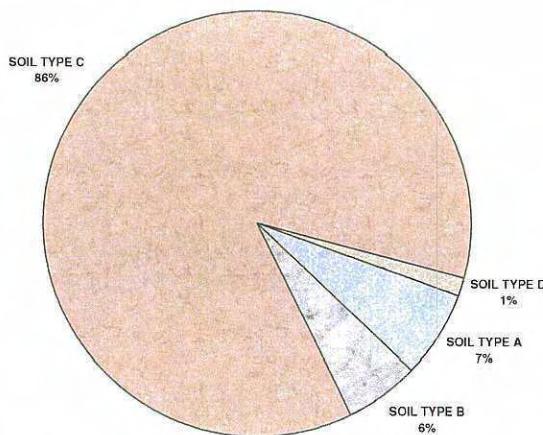


Figure 3-1 Hydrologic Soil Types

Table 3-2 Summary of Site Soil Types

Soil Name	Symbol	Hydrologic Soil Type	Erodibility	Area (acre)	Fraction
Tujunga Sand 0-5%	TuB	A	Severe	12.0	0.07
SOIL TYPE A SUBTOTAL				12.0	0.07
Cienaba Coarse Sandy Loam 15-30%	CIE2	B	Severe	10.0	0.06
Greenfield Sandy Loam 0-2%	GrA	B	Severe	0.04	0.00
Vista Coarse Sandy Loam 15-30%	VsE	B	Moderate	0.01	0.00
SOIL TYPE B SUBTOTAL				10.1	0.06
Fallbrook Sandy Loam 9-15% (Eroded)	FaD2	C	Severe	28.4	0.16
Fallbrook Sandy Loam 15-30% (Eroded)	FaE2	C	Severe	24.6	0.14
Fallbrook Rocky Sandy Loam 9-30% (Eroded)	FeE2	C	Severe	5.5	0.03
Ramona Sandy Loam 2-5%	RaB	C	Severe	11.5	0.06
Ramona Sandy Loam 5-9% (Eroded)	RaC2	C	Severe	13.1	0.07
Ramona Sandy Loam 9-15% (Eroded)	RaD2	C	Severe	73.6	0.41
SOIL TYPE C SUBTOTAL				156.7	0.86
Las Posas Fine Sandy Loam 5-9% (Eroded)	LpC2	D	Severe	0.2	0.00
Las Posas Stony Fine Sandy Loam 15-30% (Eroded)	LpE2	D	Severe	2.3	0.01
SOIL TYPE D SUBTOTAL				2.5	0.01
TOTAL				181.3	1.00

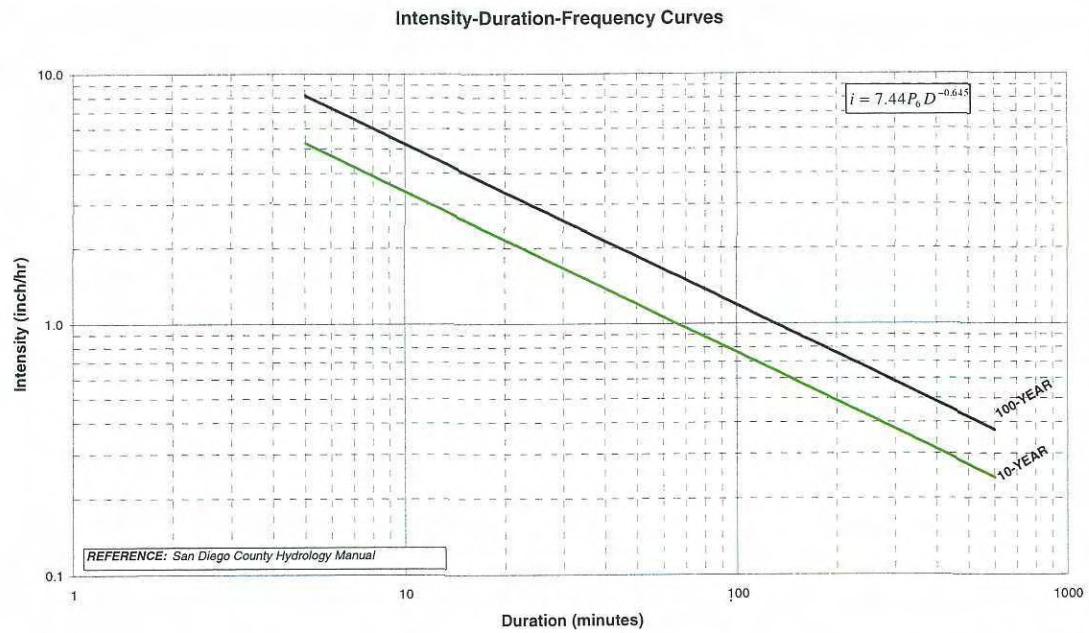


Figure 3-2 IDF Curves for Project Site (100-year $P_6=3.1$ inches)

3.10 CONTAMINATED SOIL AND HAZARDOUS WASTE ASSESSMENT

RBF performed a Phase I Environmental Site Assessment (ESA) for the project site in January 2003 in accordance with American Society of Testing Materials (ASTM) Standard Practice E 1527-00. Several areas within the boundaries of the subject site were identified as containing materials that are a potential source of a recognized environmental condition. These areas consist of former aboveground storage tanks (ASTs), one undocumented underground storage tank (UST), several 55-gallon drums, unsealed 5-gallon buckets (observed to contain waste oil), stained soils, abandoned vehicle equipment (old tractors), and miscellaneous debris. All miscellaneous vehicles, equipment, construction and irrigation materials, debris piles, ASTs, 55-gallon drums, and 5-gallon buckets will be demolished and/or removed and properly disposed of at an off-site location, prior to development of the subject site.

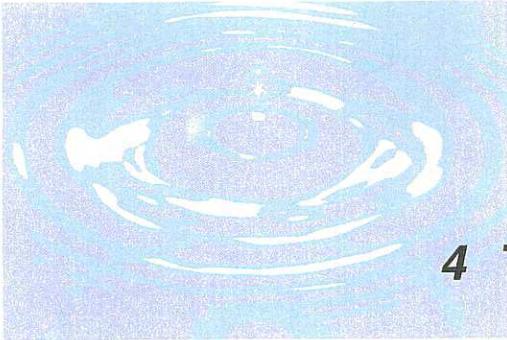
The Phase I ESA identified three on-site areas where visible evidence of dark surface soil staining of oil/petroleum products was present. Stained soils onsite were tested in three areas of the site on August 3, 2006: beneath a parked truck (Area A) and beneath a parked piece of onsite machinery (Area B) in the southern portion of the site, and beneath the former location of a tractor in the northern portion of the site; refer to Figure 2 of Appendix G-4. Testing revealed that total petroleum hydrocarbons (TPH) as gasoline and TPH as diesel were below the practical limit of 10 milligrams per kilograms (mg/kg); however, soils tested in one area revealed TPH as heavy oil at a concentration of 1,090 mg/kg.

Soils in Areas A and B were also tested for arsenic and lead. Arsenic was determined to exceed U.S. EPA Region IX Preliminary Remediation Goals (PRGs) for Residential Soils in Area A; however, it is likely that arsenic in this soil is naturally occurring. Lead levels also exceeded the California-modified PRG in the soil sample taken in Area B. It was determined that these soils are impacted by petroleum hydrocarbons and lead.

In the northern portion of the site, soils were sampled using a hand auger to explore subsurface soils beneath an area of staining to estimate the depth of impact; refer to Figure 2 of Appendix G-4. The staining occurred beneath the former location of a tractor.

To mitigate for potential impacts resulting from contaminated soils, prior to the issuance of a grading permit, the applicant shall excavate all impacted soil onsite. All excavated soil will be placed in 55-gallon drums or other appropriate container and characterized for offsite disposal. Evidence of the excavation activities shall be submitted to the satisfaction of the Director of the Department of Environmental Health (DEH).

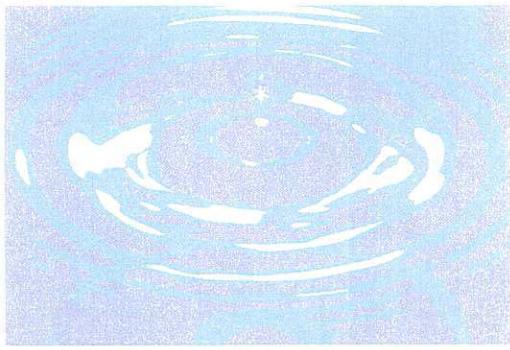
One on-site UST associated with former agricultural operations was identified in the Phase I ESA; however, the tank has long been abandoned and is no longer utilized for storage. The tank is located in the area proposed for the private equestrian uses, and therefore, not in an area that would be utilized for residential purposes. For these reasons, the UST is not considered to represent a significant health hazard through reasonably foreseeable release of hazardous materials into the environment. The area under the maintenance/workshop building will be excavated for evidence of the underground storage tank (UST). If a UST is found, the removal of the UST shall be done in accordance with a remediation plan approved by the Director of DEH.



4 Treatment Best Management Practice Plan Requirements

CRITERIA	YES	NO	INSTRUCTIONS
1. Is this an emergency project?		✓	If YES, go to 6. If NO, continue to 2.
2. Are there established TMDLs for surface waters within the project limits?		✓	If YES, go to 5. If NO, continue to 3.
3. Will the project directly discharge to a 303(d) impaired receiving water body?		✓	If YES, go to 5. If NO, continue to 4.
4. Is this project within the urban and environmentally sensitive areas? (see SUSMP Appendix B)	✓		If YES, continue to 5. If NO, go to 6.
5. Consider approved treatment control BMPs for the project.	✓		If YES, continue to 7. <i>Treatment control BMPs selection and design are discussed further in Section 11.</i>
6. Project is not required to consider treatment BMPs			If project is not required to consider treatment control BMPs, document for the project file by referencing this checklist.
7. END			

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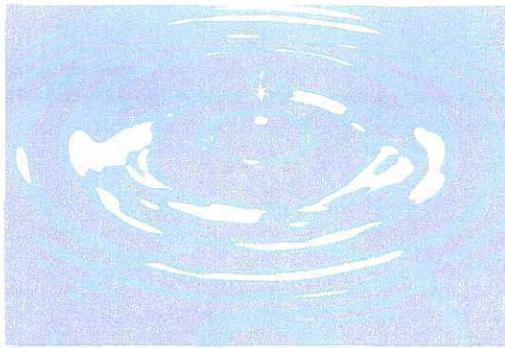
5 Watershed Identification

- | | | |
|---|--|---|
| <input type="checkbox"/> San Juan (901) | <input type="checkbox"/> Santa Margarita (902) | <input type="checkbox"/> Carlsbad (904) |
| <input type="checkbox"/> San Dieguito (905) | <input type="checkbox"/> Penasquitos (906) | <input type="checkbox"/> Pueblo San Diego (908) |
| <input type="checkbox"/> Sweetwater (909) | <input checked="" type="checkbox"/> Otay (910) | <input type="checkbox"/> Tijuana (911) |

Receiving Water	Un-Named Tributaries, Jamul Creek
Hydrologic Unit	Otay (HU 910.00)
Hydrologic Area	Dulzura (HA 910.30)
Hydrologic Sub-Area	Jamul (HSA 910.33)

303(d) Impairments
NONE

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6 Beneficial Uses

This section summarizes the beneficial uses of surface water and ground water resources downstream of the project.

6.1 DEFINITIONS

The Porter-Cologne Act establishes a comprehensive program for the protection of beneficial uses of the waters of the state. California Water Code Section 13050(f) describes the beneficial uses of surface and ground waters that may be designated by the State or Regional Board for protection as follows:

“Beneficial uses of the waters of the state that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.”

Beneficial uses for surface waters are designated under the Clean Water Act Section 303 in accordance with regulations contained in 40 CFR 131. The State is required to specify appropriate water uses to be achieved and protected. The beneficial use designation of surface waters of the state must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation.

In 1972, the State Board adopted a uniform list and description of beneficial uses to be applied throughout all basins of the State. During the 1994 Basin Plan update, beneficial use definitions were revised and some new beneficial uses were added. The following beneficial uses are defined statewide and are designated within the San Diego Region:

Municipal and Domestic Supply. Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Agricultural Supply. Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Industrial Process Supply. Includes uses of water for industrial activities that depend primarily on water quality.

Industrial Service Supply. Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

Ground Water Recharge. Includes uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Freshwater Replenishment. Includes uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

Navigation. Includes uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

Hydropower Generation. Includes uses of water for hydropower generation.

Contact Water Recreation. Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.

Non-Contact Water Recreation. Includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing. Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Aquaculture. Includes the uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Warm Freshwater Habitat. Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

Cold Freshwater Habitat. Includes uses of water that support cold-water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

Inland Saline Water Habitat. Includes uses of water that support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat. Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Marine Habitat. Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

Wildlife Habitat. Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife

(e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Preservation of Biological Habitats of Special Significance. Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

6.1.1 Beneficial Uses: Inland Surface Waters

The RWQCB San Diego Basin Plan identifies several beneficial uses of receiving inland surface waters. **Table 6-1** summarizes the beneficial uses identified for downstream inland surface waters.

6.1.2 Beneficial Uses: Coastal Waters

San Diego Bay is approximately 18 miles downstream of the project site, and isolated from the project site by the Lower Otay Reservoir. **Table 6-2** summarizes the beneficial uses identified for downstream coastal waters.

6.1.3 Beneficial Uses: Lake and Reservoirs

Lower Otay Reservoir is located approximately 5 miles downstream of the project site. **Table 6-3** summarizes the beneficial uses identified for downstream lakes and reservoirs.

6.1.4 Beneficial Uses: Groundwater Resources

The RWQCB Basin Plan identifies the beneficial uses of groundwater resources area. **Table 6-4** summarizes the beneficial uses of downstream groundwater resources.

**Table 6-1 Beneficial Uses of Downstream Inland Surface Waters
(RWQCB, 1998)**

Receiving Water (Hydrologic Unit Code)	Beneficial Use													
	Municipal/Domestic Supply	Agricultural Supply	Industrial Service Supply	Industrial Process Supply	Groundwater Recharge	Freshwater Replenishment	Hydropower Generation	Contact Water Recreation	Non-Contact Water Recreation	Significant Biological Habitats	Warm Freshwater Habitat	Cold Freshwater Habitat	Wildlife Habitat	Rare Species
Jamul Creek (HSA 910.33)	●	●	●	●				●	●		●	●	●	
Lower Otay Reservoir	See Lakes and Reservoirs (Table 6-3)													
Otay River (HSA 910.20)	+	●	●					●	●		●	●		
San Diego Bay (HA 910.20)	See Coastal Waters (Table 6-2)													

**Table 6-2 Beneficial Uses of Downstream Coastal Waters
(RWQCB, 1998)**

Receiving Water (Hydrologic Unit Code)	Beneficial Use													
	Industrial	Navigation	Contact Water Recreation	Non-Contact Water Recreation	Commercial/Sport Fishing	Significant Biological Habitats	Estuarine Habitat	Wildlife Habitat	Rare Species	Marine Habitat	Aquaculture	Aquatic Organism Migration	Spawning	Warm Freshwater Habitat
San Diego Bay (HSA 909.12)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

**Table 6-3 Beneficial Uses of Downstream Lakes and Reservoirs
(RWQCB, 1998)**

Receiving Water (Hydrologic Unit Code)	Beneficial Use												
	Municipal/Domestic Supply	Agricultural Supply	Industrial Process Supply	Industrial Service Supply	Groundwater Recharge	Freshwater Replenishment	Contact Water Recreation ⁽¹⁾	Non-Contact Water Recreation	Warm Freshwater Habitat	Cold Freshwater Habitat	Wildlife Habitat	Rare Species	Hydropower Generation
Lower Otay Reservoir (910.31)	●	●	●	●			●	●	●	●	●	●	

(1) Fishing from shore or boat is permitted, but other water contact recreation uses are prohibited.

**Table 6-4 Beneficial Uses of Downstream Ground Waters
(RWQCB, 1998)**

Receiving Water (Hydrologic Unit Code)	Beneficial Use					
	Municipal/Domestic Supply	Agricultural Supply	Industrial Service Supply	Industrial Process Supply	Freshwater Replenishment	Groundwater Recharge
Dulzura (HSA 910.30)	●	●	●			

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7 Pollutants of Concern

7.1 POTENTIAL POLLUTANTS

The proposed project is not expected to generate significant amounts of pollutants, but many constituents are generally anticipated for projects in this category. Table 7-1 identifies anticipated pollutants that might be generated from priority project categories.

**Table 7-1 Anticipated and Potential Pollutants by Project Type
(San Diego County, 2002a)**

Priority Project Categories	General Pollutant Categories								
	Sediments	Nutrients	Heavy Metals	Organic Substances	Trash and Debris	Oxygen-Demanding Substances	Oils and Grease	Bacteria and Viruses	Pesticides
Detached Residential	✓	✓			✓	✓	✓	✓	✓
Attached Residential	✓	✓			✓	P ⁽¹⁾	P ⁽²⁾	P	✓
Commercial (>100,000 sf)	P ⁽¹⁾	P ⁽¹⁾		P ⁽²⁾	✓	P ⁽⁵⁾	✓	P ⁽³⁾	P ⁽⁵⁾
Auto Repair Shops			✓	✓	✓		✓		
Restaurants					✓	✓	✓	✓	
Hillside Development (>5,000 sf)	✓				✓	✓	✓		✓
Parking Lots	P ⁽¹⁾	P ⁽¹⁾	✓		✓	P ⁽¹⁾	✓		P ⁽¹⁾
Streets, Highways, and Freeways	✓	P ⁽¹⁾	✓	P ⁽⁴⁾	✓	P ⁽⁵⁾	✓		
Retail Gasoline Outlets			✓	P ⁽⁴⁾	✓		✓		

(1) A potential pollutant if landscaping exists on-site; (2) A potential pollutant if the project includes uncovered parking areas; (3) A potential pollutant if land use involved food or animal waste products; (4) Including petroleum hydrocarbons; (5) Including solvents.

7.2 POLLUTANTS

The following discussion briefly describes the pollutants listed in Table 7-1.

7.2.1 Sediment

Sediments are soils or other surface materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

7.2.2 Nutrients

Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.

7.2.3 Trash and Debris

Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

7.2.4 Oxygen-Demanding Substances

This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.

7.2.5 Oil and Grease

Oil and grease are characterized as high-molecular weight organic compounds. The primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

7.2.6 Bacteria and Viruses

Bacteria and viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

7.2.7 Pesticides

Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

7.3 PRIMARY POLLUTANTS OF CONCERN

Primary pollutants of concern are pollutants that correspond to Clean Water Act section 303(d) impairment of the receiving waters of the project and may aggravate the identified impairment(s). Table 7-2 summarizes these primary pollutants of concern and the treatment control BMPs applied to the project site that target them (see Section 11 for more information).

Table 7-2 Primary Pollutants of Concern versus BMP Matrix

Condition of Concern (Impairments)	Primary Pollutants of Concern (Potential Aggravating Pollutant Sources)	Permanent Best Management Practice(s)
NONE		

The most immediate receiving water for the project site is Unnamed Tributary to Jamul Creek. Jamul Creek flows to the Lower Otay Reservoir, the Otay River, and ultimately to San Diego Bay. According to the California 2002 303(d) list published by the San Diego Regional Water Quality Control Board (RWQCB Region 9), none of the immediate receiving waters, or receiving waters further downstream of the site, are impaired for any pollutants. However, the fact that the Lower Otay Reservoir (5 miles downstream) is used for drinking water supply should be given consideration in the water quality effect analysis. Table 3-1 summarizes the receiving waters and their classification by the RWQCB Region 9.

7.4 SECONDARY POLLUTANTS OF CONCERN

Pollutants that are anticipated from the project, but are not correlated to receiving water impairments are considered secondary pollutants of concern. Table 7-3 summarizes the secondary pollutants of concern and the treatment control BMPs applied to the project site that target them (see Section 11 for more information).

Table 7-3 Secondary Pollutants of Concern versus BMP Matrix

Anticipated Pollutants	Potential Aggravating Pollutant Source(s)	Permanent Best Management Practice(s)
Sediment	Roadways	Roadside Vegetated Swales
Nutrients	Residential Development	On-Lot Measures
Trash and Debris		Homeowner Outreach
O ₂ -Demanding Substances	Equestrian Waste	Manure Management Plan
Oils and Grease		Vegetated Swales
Bacteria and Viruses		Bioretention Area at Polo Field
Pesticides	Sediment-Adsorbed Pollutants	Establish Vegetation
		Riprap Aprons

The most important secondary pollutants of concern from this residential development will be (1) an increase in sediment discharge from the site due to concentration of flows (which may carry adsorbed pollutants of concern); (2) trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste), which may create a “habitat” for harmful bacteria; and (3) pesticides, oils, grease, and other hydrocarbons from landscaped areas, parking lots, and driveways.

Sediment discharge and eroded soil are of most concern during construction phase of the project. A complete program of construction Best Management Practices (BMPs) will be developed for the project site, and will be described in a Storm Water Pollution Prevention Program (SWPPP) for Construction Activities as part of the approval of the final grading plans. The construction BMPs will address this condition of concern during the construction phase.

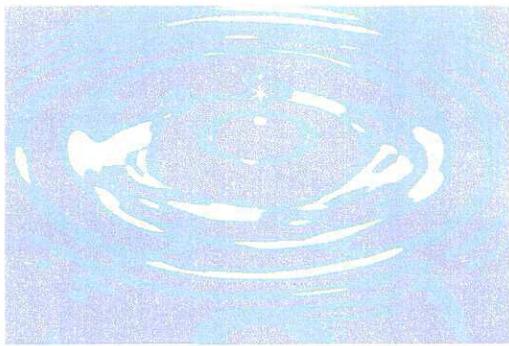
Sediment discharge and eroded soil will also be a condition of concern after construction is complete. On one hand, leveling and stabilizing the site might actually reduce the sediment yield from the site. However, concentration of flows at the culverts will potentially generate erosive conditions on hillsides. Riprap protection, landscape planting, and other measures will be taken to ensure that the constructed slopes and areas downstream of culverts are adequately protected from concentrated storm water flows.

Other common pollutants from detached residential housing have the potential to aggravate downstream impairments. Eroded soils may increase total dissolved solids, and may carry nutrients like phosphorous into downstream receiving waters. Biodegradable materials in trash can lower dissolved oxygen. It is possible that pet waste would help aggravate downstream coliform and bacterial impairments, but given the low magnitude and the distance of the site from the impairment, this condition of concern is not probable and therefore should be given a low priority. Source control and treatment control (for example, vegetated swales) BMPs will mitigate potential pollutants like soil-borne

nutrients and chemicals, trash, and hydrocarbons, to the maximum extent practical after construction is complete.

Equestrian activities on the site have the potential to aggravate bacterial conditions on downstream waters. Source controls like a manure management plan (see Section 10.1.3.1) and treatment control (for example, vegetated swales and bioretention area at polo fields) will mitigate these potential water quality stressors to the maximum extent practical after construction is complete.

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8 Construction BMPs

Best management practices to prevent, reduce, or treat storm water pollution will be implemented during the construction phase of the project. Table 8-1 and Table 8-2 (next pages) summarize the Construction BMPs that will be used for the project. The applicant is responsible for the placement and maintenance of the BMPs selected.

Because the project site is larger than one acre in size, a full Storm Water Pollution Prevention Plan for Construction Activities (SWPPP) will be developed for the project under separate cover from this SWMP. Please reference the SWPPP and erosion control plans for additional construction-phase BMP information.

Table 8-1 Minimum Required Construction BMPs

Minimum Required Best Management Practices (BMPs)	Caltrans Stormwater Handbook Reference Detail	BMP Selected	Explanation (If No BMP Selected)
<i>Step 1 Select Erosion Control method for graded Slopes (choose at least one)</i>			
Vegetation Stabilization Planting (see note 1)	SS-2 SS-4	<input checked="" type="checkbox"/>	
Hydraulic Stabilization Hydroseeding (see note 1)	SS-3 SS-4	<input checked="" type="checkbox"/>	
Bonded Fiber Matrix (see note 2)	SS-4	<input type="checkbox"/>	
Physical Stabilization / Erosion Control Blanket (see note 2)	SS-7	<input type="checkbox"/>	
<i>Step 2 Select Erosion Control Method for Graded Flat Areas (Slope < 5%) (Choose at Least One)</i>			
Will use above Slope Control measures on flat areas also	SS-2,3,4,7	<input checked="" type="checkbox"/>	
Mulch, straw, wood chips, soil application	SS-6 SS-8	<input type="checkbox"/>	
De-silting Basin (must treat all site runoff)	SC-2	<input type="checkbox"/>	
<i>Step 3 If runoff is concentrated, velocity must be controlled using energy dissipater</i>			
Energy Dissipater Outlet Protection (see note 3)	SS-10	<input checked="" type="checkbox"/>	
<i>Step 4 Select Sediment Control method for all disturbed areas (choose at least one)</i>			
Silt Fence	SC-1	<input type="checkbox"/>	
Straw Wattles	SC-5	<input checked="" type="checkbox"/>	
Gravel Bags	SC-6 & 8	<input checked="" type="checkbox"/>	
Storm Drain Inlet Protection	SC-10	<input type="checkbox"/>	
De-silting Basin (sized for 10-year flow)	SC-2	<input checked="" type="checkbox"/>	
<i>Step 5 Select method for preventing offsite tracking of sediment (choose at least one)</i>			
Stabilized Construction Entrance	TC-1	<input checked="" type="checkbox"/>	
Construction Road Stabilization	TC-2	<input type="checkbox"/>	
Entrance/Exit Tire Wash	TC-3	<input type="checkbox"/>	
Entrance/Exit Inspection & Cleaning Facility	-	<input type="checkbox"/>	
<i>Step 6 Select the General Site Management BMPs for each waste that will be on site</i>			
Materials Management / Material Delivery & Storage	WM-1	<input checked="" type="checkbox"/>	
Waste Management / Concrete Waste Management	WM-8	<input checked="" type="checkbox"/>	
Solid Waste Management	WM-5	<input checked="" type="checkbox"/>	
Sanitary Waste Management	WM-9	<input checked="" type="checkbox"/>	
Hazardous Waste Management	WM-6	<input type="checkbox"/>	

Notes:

1. When Planting or Hydroseeding are selected for erosion control, the vegetative cover must be planted by August 15th and established by October 1st. If in the opinion of the County Official the vegetative cover is not established by October 1st, additional hydraulic or physical erosion control BMPs will be required.
2. These BMPs are temporary measures only when used without planting or hydroseeding. All slopes must have established vegetative cover prior to final grading approval.
3. Regional Standard Drawing D-40 - Rip Rap Energy Dissipater is also acceptable for velocity reduction.
4. Not all grading projects will have every waste identified. The applicant is responsible for identifying wastes that will be on-site and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 should be selected.

Table 8-2 Additional Construction BMPs

Best Management Practices (BMPs)	Caltrans Stormwater Handbook Detail	BMP Selected
EROSION CONTROL		
Site Development Considerations		
Scheduling	SS-1	<input checked="" type="checkbox"/>
Preservation of Existing Vegetation	SS-2	<input checked="" type="checkbox"/>
Other (submit description for approval)		<input type="checkbox"/>
Vegetation Stabilization		
Vegetation Buffer Strips	SS-2	<input type="checkbox"/>
Physical Stabilization		
Dust Control	WE-1	<input checked="" type="checkbox"/>
Soil Stabilizers	SS-5	<input type="checkbox"/>
DIVERSION OF RUNOFF		
Earthen Dikes	SS-9	<input type="checkbox"/>
Ditches and Berms	SS-9	<input type="checkbox"/>
Slope Drains	SS-11	<input type="checkbox"/>
Temporary Drains & Swales	SS-9	<input checked="" type="checkbox"/>
VELOCITY REDUCTION		
Check Dams	SS-4	<input type="checkbox"/>
Slope Terracing	-	<input type="checkbox"/>
SEDIMENT CONTROL		
Brush or Rock Filter	-	<input type="checkbox"/>
Sediment Trap	SC-3	<input type="checkbox"/>
Sediment Basin	SC-2	<input type="checkbox"/>
GENERAL SITE MANAGEMENT		
Employee & Subcontractor Training	-	<input checked="" type="checkbox"/>
<i>Materials Management</i>		
Spill Prevention & Control	WM-4	<input checked="" type="checkbox"/>
<i>Waste Management</i>		
Contaminated Soil Management	WM-7	<input type="checkbox"/>
<i>Vehicle and Equipment Management</i>		
Vehicle & Equipment Cleaning	NS-8	<input checked="" type="checkbox"/>
Vehicle & Equipment Fueling	NS-9	<input checked="" type="checkbox"/>
Vehicle & Equipment Maintenance	NS-10	<input checked="" type="checkbox"/>
<i>Construction Practices</i>		
Water Conservation	NS-1	<input checked="" type="checkbox"/>
Structure Construction & Painting	-	<input checked="" type="checkbox"/>
Paving Operations	NS-3	<input checked="" type="checkbox"/>
Dewatering Operations	NS-2	<input checked="" type="checkbox"/>

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9 Site Design BMPs

Site design BMPs aim to conserve natural areas and minimize impervious cover, especially impervious areas ‘directly connected’ to receiving waters, in order to maintain or reduce increases in peak flow velocities from the project site. The project has incorporated site design BMPs to the maximum extent possible. This section summarizes the selection and application of site design BMPs on the project site.

9.1 SITE DESIGN BMP SELECTION MATRIX

SITE DESIGN BMP OPTION	YES	NO	N/A	EXPLANATION ¹
1. Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	✓			The project does not propose development within 100-year floodplains or inundation areas. The project has been laid out to avoid excessively steep slopes as much as possible. The Peaceful Valley Ranch applies buffers as a site-design BMP by setting back residential and equestrian structures at least 25 feet from barren streambeds and 50 feet from streambeds with riparian habitat and other sensitive areas.
2. Can the project be designed to minimize impervious footprint?	✓			Street widths have been designed to the County minimum standard. The parking area associated with the polo field will be designed with materials other than asphalt or concrete paving. The parking areas will be surfaced with decomposed granite (DG), which provides more infiltration than pavements such as asphalt or concrete.
3. Conserve natural areas where feasible?	✓			Project dedicates several areas as open-space easements. Residential and equestrian structures are set back at least 25 feet from barren streambeds and 50 feet from streambeds with riparian habitat and other sensitive areas.

¹ Explanation is only required if “NO” or “N/A” is indicated; if YES is checked, it is assumed that the measure was used for this project.

SITE DESIGN BMP OPTION	YES	NO	N/A	EXPLANATION ¹
4. Where landscape is proposed, can rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping?	✓			Roof leaders will be used on all homes built within the proposed project. Runoff will also be diverted to a pervious area or to a treatment area on each individual lot using site grading, channels or berms, as opposed to flowing directly to the street and thus to the storm drain system. Cisterns and rain barrels, practices that store rooftop runoff, may be used at the discretion of the individual homeowners.
5. For roadway projects, can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	✓			The project will preserve the alignment and profile of the streambed of the Jamul Creek tributaries on the project site. Stream crossings will be constructed as clear spans or with similar low-impact configurations, which will minimize disruption to the hydraulic and sediment regime of the streams.
6. Can any of the following methods be utilized to minimize erosion from slopes:				
6.a. Disturbing existing slopes only when necessary?	✓			
6.b. Minimize cut and fill areas to reduce slope lengths?	✓			
6.c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	✓			
6.d. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	✓			
6.e. Rounding and shaping slopes to reduce concentrated flow?	✓			
6.f. Collecting concentrated flows in stabilized drains and channels?	✓			
OTHER SITE DESIGN BMP'S				
Riprap Energy Dissipaters		✓		Riprap aprons have been placed downstream of all storm drains and culverts on the site, which will help prevent this concentration of flow from becoming an erosion hazard and/or increasing the long-term sediment discharge from the site.

9.2 PROJECTS WITHIN CHANNELS

The following decision matrix must be completed for projects that include work within channels. The information is obtained from the project drainage report.

ITEM	CRITERIA	YES	NO	N/A	INSTRUCTIONS	EXPLANATION
	The project includes work within drainage channels.				If YES, START at 1.	The project will preserve the alignment and profile of the streambed of the Jamul Creek tributaries on the project site. Stream crossings will be constructed as clear spans or with similar low-impact configurations, which will minimize disruption to the hydraulic and sediment regime of the streams.
1.	Will the project increase velocity or volume of downstream flow?				✓ If YES go to 5.	
2.	Will the project discharge to unlined channels?				✓ If YES go to 5.	
3.	Will the project increase potential sediment load of downstream flow?				✓ If YES go to 5.	
4.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect upstream and/or downstream channel stability?				✓ If YES go to 7.	
5.	Review channel lining materials and design for stream bank erosion.				✓ Continue to 6.	
6.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.				✓ Continue to 7.	
7.	Include, where appropriate, energy dissipation devices at culverts.				✓ Continue to 8.	
8.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.				✓ Continue to 9.	
9.	Include, if appropriate, detention facilities to reduce peak discharges.				✓ Continue to 11.	
10.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.				✓	
11.	Provide other design principles that are comparable and equally effective.				✓ Continue to 12.	
12.	End					

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10 Source Control BMPs



Source-control BMPs are activities, practices, and procedures (primarily non-structural) that are designed to prevent urban runoff pollution. These measures either reduce the amount of runoff from the site or prevent contact between potential pollutants and storm water. Also, source-control BMPs are often the best method to address non-storm (dry-weather) flows. The following table lists source-control BMP alternatives and indicates the practices that will be applied at the project site.

10.1.1 Source Control BMP Selection Matrix

SOURCE CONTROL BMP OPTION		YES	NO	N/A	EXPLANATION ¹
1.	Storm Drain System Stenciling and Signage				
1.a.	All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language and/or graphical icons to discourage illegal dumping.	✓			
1.b.	Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.	✓			
2.	Outdoor Material Storage Areas				
2.a.	This is a detached single-family residential project. Therefore, personal storage areas are exempt from this requirement.	✓			

¹ Explanation is only required if "NO" or "N/A" is indicated; if YES is checked, it is assumed that the measure was used for this project.

SOURCE CONTROL BMP OPTION	YES	NO	N/A	EXPLANATION ¹
2.b. Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.			✓	
2.c. The storage area shall be paved and sufficiently impervious to contain leaks and spills.		✓		
2.d. The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.		✓		
3. Trash Storage Areas				
3.a Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,	✓			Trash storage areas affiliated with the polo field complex will be outfitted with appropriate source-control BMPs.
3.b. Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.	✓			
4. Efficient Irrigation Systems and Landscape Design The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible.				
4.a Employing rain shutoff devices to prevent irrigation after precipitation.				
4.b. Designing irrigation systems to each landscape area's specific water requirements.				
4.c. Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.				
4.d. Employing other comparable, equally effective, methods to reduce irrigation water runoff.	✓			Common areas such as polo field complex will employ efficient irrigation systems and landscape design.

SOURCE CONTROL BMP OPTION	YES	NO	N/A	EXPLANATION ¹
5. Private Roads The design of private roadway drainage shall use at least one of the following:				
5.a. Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	✓			
5.b. Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter.				
5.c. Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.				
5.d. Other methods that are comparable and equally effective within the project.				
Residential Driveways & Guest Parking The design of driveways and private residential parking areas shall use one at least of the following features.				
6.a. Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.	✓			Driveways will drain to landscape.
6.b. Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.		✓		
6.c. Other features which are comparable and equally effective.		✓		
Dock Areas Loading/unloading dock areas shall include the following.				
7.a. Cover loading dock areas, or design drainage to preclude urban run-on and runoff.	✓			Any loading/unloading dock facilities affiliated with the polo field complex will be outfitted with appropriate source control BMPs.

SOURCE CONTROL BMP OPTION		YES	NO	N/A	EXPLANATION ¹
7.b.	Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.	✓			
7.c.	Other features which are comparable and equally effective.	✓			
8.	Maintenance Bays				
8.a.	Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.		✓		The project does not include any maintenance bays.
8.b.	Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.		✓		
8.c.	Other features which are comparable and equally effective.		✓		
9.	Vehicle Wash Areas Priority projects that include areas for washing/steam cleaning of vehicles shall use the following.				
9.a.	Self-contained; or covered with a roof or overhang.		✓		The project does not include any vehicle wash areas.
9.b.	Equipped with a clarifier or other pretreatment facility.		✓		
9.c.	Properly connected to a sanitary sewer.		✓		
9.d.	Other features which are comparable and equally effective.		✓		
10.	Outdoor Processing Areas Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements.				

SOURCE CONTROL BMP OPTION	YES	NO	N/A	EXPLANATION ¹
10.a. Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.			✓	The project does not include any outdoor processing areas.
10.b. Grade or berm area to prevent run-on from surrounding areas.	✓			
10.c. Installation of storm drains in areas of equipment repair is prohibited.	✓			
10.d. Other features which are comparable or equally effective.	✓			
Equipment Wash Areas Outdoor equipment/accessory washing and steam cleaning activities shall be:				
11.a. Be self-contained; or covered with a roof or overhang.	✓			The project does not include any equipment wash areas.
11.b. Be equipped with a clarifier, grease trap or other pretreatment facility, as Appropriate	✓			
11.c. Be properly connected to a sanitary sewer.	✓			
11.d. Other features which are comparable or equally effective.	✓			
Parking Areas The following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County.				
12.a. Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.	✓			Landscaping will be incorporated into the drainage design at polo field complex parking areas.
12.b. Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.	✓			The parking area associated with the polo field will be designed with materials other than asphalt or concrete paving. The parking areas will be surfaced with decomposed granite (DG), which provides more infiltration than pavements such as asphalt or concrete.

SOURCE CONTROL BMP OPTION		YES	NO	N/A	EXPLANATION¹
13.	Fueling Areas Non-retail fuel dispensing areas shall contain the following.				
13.a.	Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.			✓	The project does not include any fueling areas.
13.b.	Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.			✓	
13.c.	Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.			✓	
13.d.	At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.			✓	
OTHER SOURCE CONTROL BMPs					
Homeowner Outreach					Please See Section 10.1.2.
Animal Waste Plan for Equestrian Activities					Please See Section 10.1.3.
On-Lot Measures (Rain Gardens)					Please See Section 10.1.4.

10.1.2 Homeowner Outreach

One source-control best management practice for residential sites is pollution prevention outreach. The key to a successful outreach campaign is to target a message to a specific audience, such as homeowners. At the sale of the property or lease-signing, the homeowner or tenant will be presented with a brochure to encourage them to develop and implement source-control best management practices. Another strategy is to attach brochures as non-binding but informative parts of private road maintenance or structural BMP maintenance agreements used for ensuring the maintenance of the structural treatment control measures. Primary areas of source-control BMP for homeowners include:

Lawn and Garden Activities. Lawn and garden activities can result in contamination of storm water through pesticide, soil, and fertilizer runoff. Proper landscape management, however, can effectively reduce water use and contaminant runoff and enhance the aesthetics of a property. Environmentally friendly landscape management can protect the environment through careful planning and design, routine soil analysis, appropriate plant selection, use of practical turf areas, water use efficiency, use of mulches, and appropriate maintenance. Additional activities that benefit water resources include maintaining healthy plants and lawns and composting lawn wastes. Healthy plants are less susceptible to diseases and insects and therefore require minimal use of pest control measures. To promote healthy plants, it is often beneficial to till composted material into the soil. Recycling of garden wastes by composting is also effective at reducing waste, although compost bins and piles should not be located next to waterways or storm drains because leachate from compost materials can cause contamination.

Water Conservation Practices. By making minor changes in water use habits, each household can reduce its water consumption while saving money on water and sewage bills. Homeowners can be made aware of practices like checking regularly for plumbing leaks and checking for water leaks by monitoring their water meters when no water is being used (such as when they go on vacation).

Pet Waste Management. When pet waste is not properly disposed of, it can wash into nearby water bodies or can be carried by runoff into storm drains. Homeowners should be encouraged to dispose of pet waste with regular trash, bury it in their yards, or flush it down the toilet. San Diego County prefers that pet waste be flushed down the drain. Alternatives to flushing include placing pet waste in the trash or burying it at least 3 feet in the ground.

Trash Management. Homeowners should be informed about their options for recycling and waste disposal, as well as the consequences of littering. It is especially important to inform residents of proper disposal procedures for household hazardous wastes.

Table 10-1 Basic Homeowner Outreach Program

-
- Do not dispose of liquids or other materials to the storm drain system
 - Report illegal dumping of any substance (liquids, trash, household toxics) to the County's toll free, 24-hour hotline 1-888-846-0800
 - Utilize the County Household Toxics Program at (800) 246-1233, for disposal of household toxics
 - Keep lawn clippings and other landscaping waste out of gutters and streets by placing it with trash for collection or by composting it
 - Clean up and properly dispose of pet waste. It is best to flush pet waste. Alternatives to flushing are placing into trash or burying it in your yard (at least 3-ft deep).
 - Observe parking restriction for street sweeping.
 - Wash automobiles at car washes or on pervious surfaces (lawns) to keep wash water out of the storm drain system.
 - Avoid excessive or improper use or disposal of fertilizers, pesticides, herbicides, fungicides, cleaning solutions, and automotive and paint products.
 - Use biodegradable, non-toxic, and less toxic alternative products to the extent possible.
 - Cover garbage containers and keep them in good repair.
 - Sweep sidewalks instead of hosing down.
 - Water lawn properly to reduce runoff.
-

Source: www.co.san-diego.ca.us/deh/stormwater/residential.html

10.1.3 Animal Waste Plan for Equestrian Activities

The equestrian facilities planned for the project site have an Animal Waste, Fly, and Vector Control Plan. The goals of this plan are to (1) safely dispose of animal waste resulting from equestrian uses onsite; (2) control potential effect on runoff through effective maintenance and stormwater practices; (3) control the presence and reproduction of flies, mosquitoes, and rodents while minimizing the use of chemical agents; and (4) minimize odor-producing sources onsite.

10.1.3.1 General Manure Management Methods

Onsite manure management will include the storage, treatment and removal of animal waste. One storage bin or dumpster will be located at both the public and private equestrian areas. The dumpsters will be emptied once every two weeks (or earlier, if needed). The dumpsters for the public and private equestrian facilities will be hauled offsite for proper disposal. A concrete block wall of adequate height to limit views will screen dumpster areas.

- The following measures shall be applied to manage the onsite storage and disposal of animal waste:
- Perform daily (at minimum) the removal of manure and soiled bedding from stalls and corrals to onsite manure bins.
- Unsoiled bedding within the stalls shall be changed once weekly or as otherwise needed.

- Utilize “Dry-Stall” flooring material (similar to cat litter) in stalls with greater potential to be continually wet (i.e. sheltered, not enclosed).
- Any manure stored in an open storage mound shall be covered (i.e. with plastic) during periods of precipitation.
- Manure shall not be stored onsite for a period exceeding fourteen days.
- Manure storage shall allow for adequate drying to occur.
- Animal waste shall be stored temporarily in an open storage mound for drying purposes, with subsequent removal offsite to a sanitary landfill.
- Maintain adequate drainage in areas where temporary storage manure occurs onsite.

10.1.3.2 General Water Management Methods

Management of onsite water sources associated with the equestrian facilities will minimize the potential for pests to breed onsite. Water will be provided within each horse stall via a self-dispensing mechanism. When the water level reaches a trigger point, the bin will refill itself. As a horse may drink an average of fifty gallons of water per day, water levels within the bin typically do not remain stagnant for long periods of time. As the water would be frequently consumed and replaced, the presence of standing water would be minimized.

Water will also be provided in 100-gallon bins at the private and public facilities. These basins will be self-dispensing and will not be covered. However, the staff will perform daily monitoring of the tubs. Water within the tubs will be replaced once per week; however, as the boarding of approximately 78 horses is anticipated onsite, water within the tubs would not remain stagnant and would frequently be consumed and replenished. If water within any onsite container were expected to remain stagnant for a period exceeding 72 hours (i.e. during periods of low use), the water would be removed and replaced by PVR staff to minimize the potential for vector breeding.

The following guidelines shall be applied to onsite water management.

- Water dispensing devices shall utilize non-leak valves.
- Ensure proper drainage within stalls, corrals, and paddock areas to minimize the potential for ponding resulting from precipitation and/or spillage from water basins.
- Soiled or bedding and/or manure and feed shall be disposed of promptly to minimize damp areas that may serve as breeding grounds.
- Areas where feed is stored or otherwise provided onsite shall be located away from water sources to minimize the reproduction of flies onsite.

10.1.4 On-Lot Treatment

“On-lot treatment” describes a series of practices designed to treat runoff from individual residential lots. Their primary purpose is to manage rooftop, driveway and sidewalk runoff. Managing runoff from these sources helps to disconnect impervious surfaces and to reduce the effect of increased impervious cover in a watershed. While the specific lot

grading associated with each home will not be finalized until the preparation of grading plans (final engineering), the project anticipates using landscaped areas on each lot to treat runoff. These vegetated areas will act as bio-retention basins or rain gardens and treat runoff on the individual lots.

With few exceptions, some sort of on-lot treatment can be applied to almost all sites. However, while on-site treatment of residential storm water runoff has been encouraged, it has not generally been an option to meet storm water requirements. This practice is changing, as municipalities and other storm water regulators realize the value of these treatment processes. According to the EPA, there are currently at least two jurisdictions that offer "credits" in exchange for the application of on-site storm water management practices. In Denver, Colorado, sites designed with methods to reduce "directly connected impervious cover" are permitted to use a lower site impervious area when computing the required storage of storm water facilities. Likewise, in Maryland, new regulations allow designers to subtract each rooftop that is disconnected from the total site impervious cover when calculating required storage in storm water management practices.

10.1.4.1 Project Location

Roof leaders *will be* used on all homes built within the proposed project. Runoff will also be diverted to a pervious area or to a treatment area on each individual lot using site grading, channels or berms, as opposed to flowing directly to the street and thus to the storm drain system. Cisterns and rain barrels, practices that store rooftop runoff, may be used at the discretion of the individual homeowners.

10.1.4.2 Siting and Design Considerations

Although most residential lots can incorporate on-lot treatment, the best option for a site depends on both site design constraints and the preferences of the homeowner. Bioretention and vegetated swales need to meet the siting requirements of those practices. The use of cisterns and rain barrels has far fewer site constraints. However, for this practice to be effective, homeowners must have a use for the stored water. These practices are therefore best suited to homeowners who have some active interest in gardening or landscaping.

Although these practices are simple compared with many other post-construction storm water practices, the designs need to incorporate the same basic elements of any other storm water practice. Pretreatment is important to ensure that these practices, such as roof leaders, do not become clogged with leaf debris. Rain barrels and cisterns should also incorporate some sort of pretreatment, such as a mesh filter at the top of the barrel or cistern.

Storage practices should also typically incorporate some type of bypass so that larger storms flow away from the house. In rain barrels or cisterns, this bypass may be a hose set at a high level of the practice and directed away from the practice and building foundation. For vegetated swales and bioretention, an on-line design directs all flows to the management practice, but larger flows generally flow over the practice and are not treated.

10.1.4.3 Maintenance Requirements

Bioretention areas, filter strips, and vegetated swales require regular maintenance to ensure that the vegetation remains in good condition. Rain barrels and cisterns require minimal maintenance, but the homeowner needs to ensure that the tank is cleaned out approximately once per year.

10.1.4.4 Pollutant Removal

Although the practices used for on-lot applications can have relatively high pollutant removals, it is not clear that these pollutant removal rates can be realized with the relatively low pollutant concentrations entering the practices. One clearly recognizable benefit of many on-lot practices, however, is that they generally promote ground water recharge, either directly through infiltration or indirectly by applying or directing runoff to pervious areas.

10.1.4.5 Cost Considerations

The cost burden of on-lot practices is generally born directly by homeowners. However, homeowners can reduce costs for many of these practices by making their own on-lot practice rather than purchasing a commercial product, and maintenance costs are essentially free.

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11 Treatment Control BMPs

Post-construction “treatment control” storm water management BMPs provide treatment for storm water emanating from the project site. Implementation of NPDES General Permit requirements entails the use of post-construction BMPs that will remain in service to protect water quality throughout the life of the project. Structural BMPs are an integral element of post-construction storm water management and include storage, filtration, and infiltration practices. BMPs have varying degrees of effectiveness versus different pollutants of concern as identified in Table 11-1.

11.1 SELECTION OF TREATMENT CONTROL BMPS

The selection, design and siting of structural BMPs within a project depend largely on the project-wide drainage plan. BMP alternatives were evaluated for their relative effectiveness for treating potential pollutants from the project site (Table 7-1); technical feasibility; relative costs and benefits; and applicable legal, institutional, and other constraints. lists treatment-control BMP alternatives and identifies the BMPs selected for the project site.

The Treatment Control BMPs have been chosen based on this Selection Matrix, comparing the list of pollutants for which the downstream receiving waters are impaired (if any) (Table 3-1), with the pollutants anticipated to be generated by the project (as identified in Table 7-1).

Any pollutants identified by Table 7-1 that correspond to a Clean Water Act section 303(d) impairment of the receiving waters of the project, are considered primary pollutants of concern. Table 7-2 summarizes these primary pollutants of concern.

11.1.1 When There are Primary Pollutants of Concern

Priority projects that are anticipated to generate primary pollutants of concern shall select a single or combination of stormwater BMPs from Table 11-1, which **maximizes pollutant removal** for the particular primary pollutant(s) of concern. Maximizing pollutant removal generally implies the selection of a BMP with a high removal efficiency for the pollutant(s) of concern, or a “treatment train” of BMPs with low or medium removal efficiencies for the pollutant(s) of concern that will maximize the removal of primary pollutant(s) of concern.

11.1.2 When There are No Primary Pollutants of Concern

Priority projects that are **not** anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired (i.e., with no primary pollutants of concern, see Section 7.4) shall select a single or combination of stormwater BMPs from Table 11-1, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the “maximum extent practicable” standard.

**Table 11-1 Treatment Control BMP Selection Matrix
(San Diego County, 2002a).**

Pollutant of Concern	Treatment Control BMP Categories						
	Biofilters	Detention Basins	Infiltration Basins ⁽¹⁾	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Continuous Flow Deflection Systems ⁽²⁾
Sediment	●	●	●	●	●	●	●
Nutrients	●	●	●	●	●	●	●
Heavy Metals	●	●	●	●	●	●	●
Organic Compounds	?	?	?	?	●	●	●
Trash & Debris	●	●	?	?	●	●	●
Oxygen Demanding Substances	●	●	●	●	●	●	●
Bacteria	?	?	●	?	●	●	●
Oils and Grease	●	●	?	?	●	●	●
Pesticides	?	?	?	?	●	?	●

(1) Including trenches and porous pavement.(2) Also known as hydrodynamic devices and baffle boxes.

Original Sources: Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993), National Stormwater Best Management Practices Database (2001), and Guide for BMP Selection in Urban Developed Areas (2001).

11.2 TREATMENT CONTROL BMP PROGRAM

Treatment control BMPs address runoff from all developed areas on the project site. Table 11-2 describes the treatment control BMPs for the project, where they are located, and the water quality flow rate (Q_{WQ}) or volume (V_{WQ}) (as applicable) treated by each. The tributary for roadside swales will be specified at final engineering based upon the final road profile. Attachment D illustrates the location of the BMPs.

Table 11-2 Summary of Treatment Control BMP Location and Numeric Sizing

Location	BMP Type	Tributary Area (acre)	Q_{100} (cfs)	Q_{WQ} (cfs)	V_{WQ} (ft³)
Roadsides	Vegetated Swale	Varies	Varies	Varies	N/A
Polo Grounds- North	Vegetated Swale	51.7	63.5	5.6	N/A
Polo Grounds - West	Vegetated Swale	54.8	66.7	6.0	N/A
Polo Grounds - East	Vegetated Swale	10.1	17.6	1.1	N/A
Polo Grounds	Bioretention Area	11.5	24.0	N/A	13,660

11.3 TREATMENT CONTROL BMP SELECTION

Table 11-3 describes the treatment control BMPs for the project and explains why they were (or were not) selected. A detailed explanation and justification is provided if a low performing BMP was selected (see Table 11-1).

Table 11-3 Treatment Control BMP Selection Summary

TREATMENT CONTROL BMP OPTION		YES	NO	N/A	EXPLANATION
1.	Biofilters				
1.a.	Grass Swale(s)	✓			Vegetated swales will be installed at roadsides and perimeter of polo grounds.
1.b.	Grass Strip(s)		✓		Site configuration lends itself to grass swales rather than strips.
1.c.	Wetland Vegetation Swale(s)		✓		Not feasible to implement wetland vegetation swale given site constraints absence of perennial low flow, and general arid climate.
1.d.	Bioretention Area(s)		✓		Bioretention area will be installed at downstream side of polo grounds.
2.	Detention Basins				
2.a.	Extended Dry Detention w/ Grass Lining		✓		Site constraints such as steep slopes preclude effective implementation of dry EDBs on upland part of site. A bioretention area will be more effective at removing pollutants of concern such as bacteria from the polo grounds.
2.b.	Extended Dry Detention Basin(s) w/ Impervious Lining	✓			See above.
3.	Infiltration Measures				
3.a	Infiltration Basin(s)		✓		Site constraints such as steep slopes and only moderate permeable soil conditions and concern regarding groundwater table preclude effective implementation of infiltration basins.
3.b.	Infiltration Trench(es)		✓		See above.

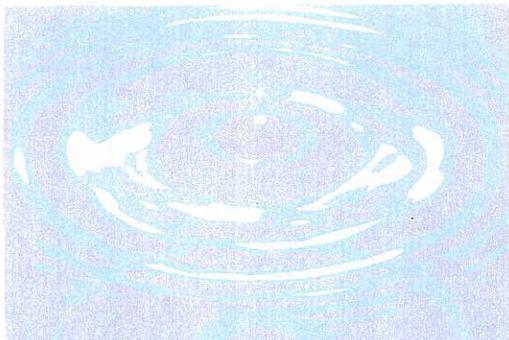
TREATMENT CONTROL BMP OPTION		YES	NO	N/A	EXPLANATION
3.c	Porous Asphalt		✓		The parking area associated with the polo field will be designed with materials other than asphalt or concrete paving. The parking areas will be surfaced with decomposed granite (DG), which provides more infiltration than pavements such as asphalt or concrete.
3.d.	Porous Concrete	✓			See above.
3.e	Porous Modular Concrete Block	✓			See above.
4. Wet Ponds or Wetlands					
4.a	Wet Detention Pond or Basin w/ Permanent Pool		✓		Not feasible to implement wetland with permanent pool due to site constraints such as steep slopes, absence of perennial low flow, and general arid climate conditions. Wetlands would likely require public maintenance funding and might generate attractive nuisance and safety issues.
4.b.	Constructed Wetland	✓			See above.
5. Drainage Inserts*					
5.a.	Oil/Water Separator(s)		✓		Because the site is serviced by roadside swales, there is little or no storm drain infrastructure to implement oil-water separators or drainage insert BMPs.
5.b	Catch Basin Insert(s)	✓			See above.
5.c.	Storm Drain Inserts	✓			See above.
5.d.	Catch Basin Screens	✓			See above.

TREATMENT CONTROL BMP OPTION		YES	NO	N/A	EXPLANATION
6.	Filtration Practices				
6.a.	Media Filtration		✓		BioRetention area will likely be more effective for pollutants of concern at polo grounds and less expensive to construct and maintain.
6.b.	Sand Filtration		✓		See above.
7.	Hydrodynamic Separator(s)				
7.a.	Swirl Concentrator(s)		✓		Because the site is serviced by roadside swales, there is little or no storm drain infrastructure to implement hydrodynamic separation devices.
7.b.	Cyclone Separator(s)		✓		See above.
7.c.	Baffle Separators		✓		See above.
7.d.	Gross Solids Removal Devices (GSRDs)		✓		See above.
7.e.	Linear Radial Device		✓		See above.

11.4 TREATMENT CONTROL BMP DESIGN

Treatment control BMPs have been designed following criteria and methodology from the County of San Diego Hydrology Manual (2003), Drainage Design Manual (2005), and Storm Water Standards (2002) as appropriate for the project site. Attachment E provides detailed descriptions and design calculations of the water quality treatment control BMPs applied to the project site.

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12 Maintenance

The San Diego Watershed Protection Ordinance requires that mechanism be in place to ensure maintenance of post-construction BMPs. The maintenance mechanisms listed by the Ordinance include: County maintenance; maintenance by another public entity; maintenance by subsequent owner(s); a County Service Area or Special Assessment District; provisions of a lease; provisions of a conditional use permit; or other mechanisms as acceptable to the County.

12.1 MAINTENANCE CATEGORIES

Treatment control stormwater BMPs fall into four primary maintenance categories: (1) minimal maintenance BMPs; (2) BMPs requiring ongoing maintenance; (3) BMPs requiring maintenance by Flood Control District, with funding tied to the specific project, and (4) BMPs where there is a broader public responsibility for maintenance, with funding mechanisms beyond the project. The County of San Diego will maintain most of the facilities proposed by this project. Table 12-1 summarizes the treatment control BMPs selected for the project site and the maintenance category they fall under.

Table 12-1 Summary of Maintenance Category for Selected BMPs

BMP Type / Location	Category 1	Category 2	Category 3	Category 4
Roadside Swales	✓			
Vegetated Swales at Polo Grounds	✓			
Bioretention Area at Polo Grounds	✓			
Riprap Energy Dissipaters (Site/Source Control)	✓			
On-Lot Measures (Source Control)	✓			

Vegetated swales require minimal maintenance and in this case are located on private property, and they are best designated as Category 1 facilities, and therefore will not require a funding mechanism.

12.2 FISCAL RESOURCES

The section briefly describes the long-term fiscal resources for the selected maintenance mechanisms.

- Roadside vegetated swales best are classified as Category 1 (Private Maintenance), and therefore will not require a specified funding mechanism. A homeowners association will maintain the private roads on the site.

- Riprap apron energy dissipaters are Category 1 (Private Maintenance), and therefore will not require a specified funding mechanism. Because the energy dissipaters are private property and generally not easily accessible to outside personnel, it will be the individual homeowners' responsibility to maintain these facilities.
- The bioretention area at the polo grounds is best classified as an infiltration-type device under Category 1 (Private Maintenance); the vegetated swales around the polo grounds are likewise best classified under Category 1 (Private Maintenance). Therefore, none of these facilities will require a specified funding mechanism. The organization administering the polo grounds (the homeowners' association or perhaps a private-membership polo club) will be responsible for maintenance of these facilities.

12.3 MAINTENANCE PROGRAM

The effectiveness of this SWMP relies on the maintenance of the storm water Best Management Practices (BMPs) proposed for the project. **Attachment F** summarizes the maintenance plan for the care and upkeep of BMPs on the project site, including frequency or maintenance indicators, and the type of maintenance required.

12.4 CONSTRUCTION, OPERATION, AND MAINTENANCE COST

This section provides a cost estimate for the construction and maintenance of the post-construction BMPs proposed for the project site. Table 12-2 and Table 12-3 summarize the estimated annual BMP operation and maintenance costs for the project.

Table 12-2 Summary of Estimated Annual BMP Operation and Maintenance Costs – Public Maintenance

BMP Type / Location	Estimated Construction Cost	Estimated O&M Cost
(None)	\$ 0	\$ 0
TOTAL	\$ 0	\$ 0

12.4.1 Vegetated Swales

CASQA (2003a) estimates that the total construction cost for vegetated swale facilities to be approximately \$0.50 per square foot. At this rate, a 10-foot wide vegetated channel around the polo grounds and fire station lot would have a construction cost of approximately \$17,500. Four-foot wide roadside swales along both sides of the road will cost on the order of \$30,000.

The operation cost of the vegetated swales will be nil, primarily because vegetated swales do not require an outside power source. To estimate annual maintenance costs for these facilities, the CASQA BMP handbook lists an estimate of approximately \$0.75 per linear foot, which would vary primarily with the amount of vegetation management (i.e., mowing) required. The maintenance cost of the roadside swales was included in the maintenance cost estimate, since the maintenance of these swales can be considered above and beyond that of a normal private street. Therefore, the maintenance cost for the

Table 12-3 Summary of Estimated Annual BMP Operation and Maintenance Costs – Private Maintenance

BMP Type / Location	Estimated Construction Cost	Estimated O&M Cost
On-Lot Measures (Individual Lots)	\$36,000	\$0 ^(a)
Vegetated Swales at Polo Grounds (35,000 sf)	\$17,500	\$2,625
Bioretention Area at Polo Grounds	\$50,000	\$12,500
Riprap Apron Energy Dissipaters (16 Individual Lots)	\$12,800	\$2,600
Roadside Vegetated Swales	\$30,000	\$11,250
TOTAL	\$146,300	\$28,975

(a) Considered as part of regular on-site landscape maintenance.

vegetated channel along throughout the project site would be on the order of \$11,250 per year. Using vegetation alternatives that do not require mowing or other intensive maintenance can significantly reduce these maintenance costs.

12.4.2 On-Lot Measures and Bioretention Area

CASQA (2003a) estimates that the total construction cost for on-lot bioretention facilities to be approximately \$4.00 per square foot. Assuming approximately 200 sf of bioretention area per lot, the construction cost of on-lot measures would be on the order of \$36,000. For the bioretention area proposed at the polo grounds, the construction cost will be on the order of \$50,000. The operation and maintenance costs for a bioretention facility will be comparable to those of typical landscaping required for a site. Assuming a unit cost of \$0.25 per square foot, the annual maintenance cost will be on the order of \$12,500. Costs beyond the normal landscaping fees will include the cost for testing the soils and may include costs for a sand bed and planting soil.

12.4.3 Energy Dissipation

The total construction cost for riprap energy dissipaters will depend on the projects final engineering design. Assuming that the riprap will be placed at the 16 discharge points in a 8'x6'x3' configuration and using a riprap cost of \$150 per cubic yard, the construction costs would be on the order of \$12,800. The operation and maintenance costs for riprap will be comparable to complete replacement costs every five years. Therefore, the approximate operation and maintenance costs will be on the order of \$2,600.

12.5 OTHER MAINTENANCE CONSIDERATIONS

Aside from the maintenance program resources required to fulfill maintenance requirements, there are several other maintenance aspects and activities to consider.

12.5.1 BMP Inspection

Property owners shall allow County staff access for inspection of BMPs maintenance plans by County staff.

12.5.2 Waste Disposal

Sediment and other pollutants shall be properly disposed of in a landfill or by another appropriate disposal method in accordance with local, state, and federal regulations. All

construction waste shall be disposed of off-site in accordance with local, state, and Federal regulations. Interim storage and disposal of these wastes shall also be in accordance with the best management practices outlined in the Storm Water Pollution Prevention Plan for Construction Activities developed for the site.

12.5.3 Best Management Practices for Maintenance Activities

Maintenance of the BMPs often requires activities like grading and the use of equipment that in themselves present a potential pollutant source. The BMPs required to address these potential pollutant sources are similar to those found in Stormwater Pollution Prevention Plans for Construction Activities (SWPPPs). Table 12-4 summarizes the BMPs that may be implemented during typical BMP maintenance activities, which usually include minor grading and other construction activities over a short duration of time outside of the rainy season. Additional BMPs may be added for major repairs of longer duration or as appropriate to particular site conditions at the time of maintenance. For instance, if a particular BMP required repair of a concrete inlet structure, BMP measures for Paving and Grinding Operations (NS-3) and Concrete Waste Management (WM-8) may become applicable. If BMP repair must take place during the rainy season, sediment control BMPs would be mandatory.

Table 12-4 Typical BMPs for BMP Maintenance Activities

Soil Stabilization BMPs	Waste Management BMPs
Scheduling (SS-1)	Material Delivery and Storage (WM-1)
Preservation of Existing Vegetation (SS-2)	Material Use (WM-2)
Tracking Control BMPs	Stockpile Management (WM-3)
Stabilized Construction Access (TC-1)	Spill Prevention and Control (WM-4)
Non-Storm Water Management BMPs	Solid Waste Management (WM-5)
Illicit Connection/Discharge Detection/Reporting (NS-6)	Hazardous Waste Management (WM-6)
Vehicle and Equipment Cleaning (NS-8)	Contaminated Soil Management (WM-7)
Vehicle and Equipment Fueling (NS-9)	Sanitary Waste Management (WM-9)
Vehicle and Equipment Maintenance (NS-10)	Liquid Waste Management (WM-10)

12.5.4 Qualifications of Maintenance Personnel

Maintenance personnel must be trained in the proper procedures to inspect treatment and source control BMPs, to determine if maintenance on the BMPs is required, and to perform such maintenance. Subsequent property owners will ensure that all personnel retained to perform BMP maintenance will have the proper training for such duties. This would entail requiring that they provide certification that they have attended training sessions.

12.5.5 Record-Keeping

The County Watershed Protection Ordinance requires that maintenance and inspection records for BMPs be kept for a minimum of three years.

Table 12-5 Alternative BMP Maintenance Mechanisms

<p>1. County Maintenance. The County agrees to accept ownership of and to maintain the BMP, under such conditions as it deems appropriate.</p>
<p>2. Maintenance By Another Public Entity. A public or acceptable quasi-public entity (e.g., the County Flood Control District, a state or federal resource agency, or a conservation conservancy) assumes responsibility for maintenance, repair and replacement of the BMP in lieu of the developer. The County may require that some or all estimated maintenance costs be front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the County may seek protection from liability by appropriate releases and indemnities.</p>
<p>3. Maintenance By A Subsequent Owner. Subsequent owners of the property provide BMP maintenance. Two mechanisms that might be used to assure maintenance by subsequent owners include a private road maintenance agreement, or developing a separate stormwater BMP maintenance agreement.</p> <p>3.a. Private Road Maintenance Agreement. If BMPs are within or adjacent to a private road easement, it may be possible to assure BMP maintenance as part of a Private Road Maintenance Agreement (PRMA). Standard PRMAs specifically require the maintenance of the drainage facilities appurtenant to the operation of the road. Because BMPs are typically associated with drainage facilities, the BMP maintenance and monitoring plan can be attached to the PRMA to become a binding part of the Agreement. PRMAs have provisions that make landowners financially responsible for maintenance of the facilities and provide the County with access to facilities for inspection.</p> <p>3.b. Stormwater BMP Maintenance Agreement. Property owners may enter into a Stormwater BMP Maintenance Agreement with the County of San Diego. The Stormwater BMP Maintenance Agreement would be modeled after a Private Road Maintenance Agreement. The agreement would make property owners financially responsible for the monitoring and maintenance of stormwater BMPs and upkeep without private road maintenance agreement.</p>
<p>4. County Service Area or Assessment District. The developed will create a County Service Area (CSA) or other funding mechanism to provide funds for BMP maintenance, repair and replacement on an ongoing basis.</p>
<p>5. Lease Provisions. In those cases where the County holds title to the land in question, and the land is being leased to another party for private or public use, the County may assure storm water BMP maintenance, repair and replacement through conditions in the lease.</p>
<p>6. Conditional Use Permits. For discretionary projects that require a use permit, the County may agree that the inclusion of appropriate terms in the use permit will provide sufficient assurance maintenance of storm water BMPs.</p>

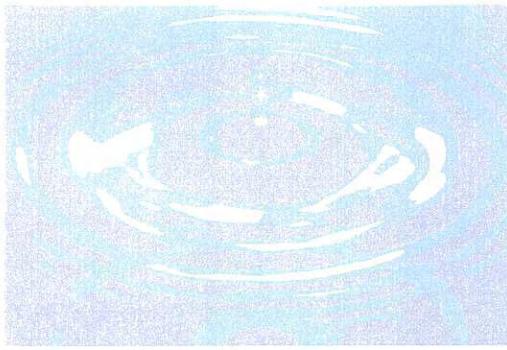
Table 12-6 Summary of BMP Maintenance Categories

	First Category	Second Category	Third Category	Fourth Category
Importance of Maintenance	Minimal maintenance concern; BMP maintenance is inherent in BMP or property stewardship	Private owners maintain the BMPs, and provide fiduciary security for County to step in and perform maintenance if necessary.	BMP warrants that Flood Control District (FCD) assumes responsibility, with funding related to project	There is a broader public responsibility for maintenance and funding (beyond project)
Typical BMPs	<input type="checkbox"/> Biofilters (Grass swale, grass strip, vegetated buffer) <input type="checkbox"/> Infiltration basin/trench	First Category Plus: <input type="checkbox"/> Minor wetland swale <input type="checkbox"/> Small detention basin <input type="checkbox"/> Single storm drain insert <input type="checkbox"/> Oil-water separator <input type="checkbox"/> Catch basin insert & screen	Second Category Plus: <input type="checkbox"/> Wetland swale or bioretention <input type="checkbox"/> Detention basin (extended/dry) <input type="checkbox"/> Wet ponds & wetlands <input type="checkbox"/> Multiple storm drain inserts	Third Category Plus: <input type="checkbox"/> Retrofit public storm drain inserts, etc. <input type="checkbox"/> Master plan facility that serves area larger than project
Enforcement Mechanisms	<input type="checkbox"/> Stormwater Ordinance requirement [section 67.819(a)&(b)], with code enforcement <input type="checkbox"/> Nuisance abatement with costs charged back to property owner <input type="checkbox"/> Condition in ongoing permit such as a Major Use Permit (if project has MUP) <input type="checkbox"/> Notice to new purchasers [67.819(e)] <input type="checkbox"/> Subdivision public report "white papers" to include notice of maintenance responsibility <input type="checkbox"/> Please see Table 12-7 for more detailed description of BMP Maintenance Enforcement Mechanisms.	First Category Plus: <input type="checkbox"/> Recorded Easement Agreement with Covenant Binding On Successors.	Filtration Systems <input type="checkbox"/> Dedication to FCD. <input type="checkbox"/> Formation of Benefit Area <input type="checkbox"/> FCD Maintenance Documentation	<input type="checkbox"/> Dedication to FCD or County. <input type="checkbox"/> FCD / County maintenance documentation
Funding Source(s)	None necessary	Security (Cash deposit, Letter of Credit, or other acceptable to County) for interim period. Agreement for security to contain provisions for release or refund, if not used.	Start-up/Interim: <input type="checkbox"/> Developer Fee Covering 24 Months of Costs. Permanent: <input type="checkbox"/> FCD Assessment per FCD Act Section 105-17.5	Varies: <input type="checkbox"/> Gas tax for BMP in road ROW <input type="checkbox"/> Transnet for CIP projects <input type="checkbox"/> Special funding or General funding for others.

Table 12-7 Description of BMP Maintenance Enforcement Mechanisms

- Stormwater Ordinance requirement: The County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (S.O.) requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action or administrative citation could also be pursued for violations of the ordinance.
- Public Nuisance Abatement: Under the S.O. failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.
- Notice to Purchasers: Section 67.819(e) of the S.O. requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.
- Conditions in Ongoing Land Use Permits: For those applications (listed in SO Section 67.804) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the SMP. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.
- Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)

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13Design Criteria

This section summarizes the design criteria and methodology applied during drainage analysis of the project site.

13.1 VOLUME-BASED WATER QUALITY NUMERIC SIZING CRITERIA

Volume-based BMPs are designed to capture and treat the most frequent storm events. Volume-based BMPs include extended detention basins, wet detention basins, and water quality treatment wetlands.

The water quality capture volume may be included as part of the configuration of the detention basins (for example, in a forebay or as initial storage in the basin), or as a stand-alone water quality basin. The water quality volumes should be provided in addition to the flood-control detention volume and debris volumes allocated for each basin.

The San Diego Regional Water Quality Control Board (RWQCB Region 9) has defined the sizing criteria for volume-based Best Management Practices as:

The volume of runoff produced from each and every storm event up to and including a historical record-based reference 24-hour rainfall criterion for treatment (0.6 inch approximate average for the San Diego County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour event.

A 24-hour, 0.6-inch rainfall has a return frequency of less than one year. The 85th percentile 24-hour event criterion was used for sizing the volume-based water quality treatment controls within the project site.

13.2 FLOW-BASED WATER QUALITY NUMERIC SIZING CRITERIA

Flow-based BMPs are sized to filter or otherwise treat the peak flow of runoff from a stormwater quality storm event. Flow-based BMPs include vegetated filter strips and swales.

The San Diego RWQCB has defined the design discharge for flow-based BMPs as the runoff generated from a storm with a rainfall intensity of 0.2 inch/hour. Flow-based water quality BMPs on the project site have been designed based upon a Rational Method analysis of this design storm, which is slightly larger than the 85th percentile event (0.1 inch/hour).

13.3 HYDROLOGIC DESIGN METHODOLOGY

13.3.1 Rational Method: Peak Flow

Runoff calculations for this study were accomplished using the Rational Method. The Rational Method is a physically-based numerical method where runoff is assumed to be directly proportional to rainfall and area, less losses for infiltration and depression storage. Flows were computed based on the Rational formula:

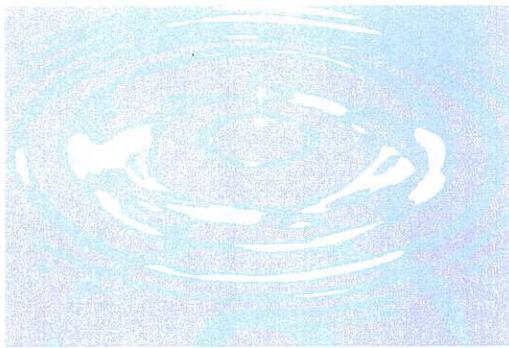
$$Q = C i A$$

where ... Q = Peak discharge (cfs);
 C = runoff coefficient, based on land use and
soil type;
 i = rainfall intensity (in/hr);
 A = watershed area (acre)

The runoff coefficient represents the ratio of rainfall that runs off the watershed versus the portion that infiltrates to the soil or is held in depression storage. The runoff coefficient is dependent on the land use coverage and soil type. The City of San Diego Drainage Design Manual methodology assumes hydrologic Soil Type D for all soils.

For a typical drainage study, rainfall intensity varies with the watershed time of concentration. The watershed time of concentration at any given point is defined as the time it would theoretically take runoff to travel from the most upstream point in the watershed to a concentration point, as calculated by equations in the San Diego County Hydrology Manual or City of San Diego Drainage Design Manual, as appropriate.

Rational Method calculations were accomplished using either the Advanced Engineering Software Rational Method Analysis (Southern California County Methods) (AES-RATSCx) or CivilCADD Rational Method Hydrology computer software packages. Peak discharges were computed for 100-year, 50-year, and 10-year hypothetical storm return frequencies. Rainfall intensity was calculated using the intensity-duration-frequency curves (IDF curves) found in the City of San Diego Drainage Design Manual.



14CEQA Summary

This section summarizes the results of the Storm Water Management Plan (SWMP) in the context of CEQA significance guidelines.

14.1 WATER QUALITY

14.1.1 Waste Discharge Requirements

Does the project violate any waste discharge requirements?

The project is not anticipated to violate any waste discharge requirements. During construction of the project, a Storm Water Pollution Prevention Plan for Construction Activities (SWPPP) will ensure proper storm water control, minimizing or eliminating storm water contact with potential pollutants and the discharge of polluted storm water from the site. The SWPPP will be in compliance with the requirements of the State Water Resources Control Board (SWRCB) General Permit for Construction Activities (Construction Permit). The project applicant will file a Notice of Intent that demonstrates their intent to comply with all requirements of the Construction Permit.

After construction, activities on the project site will not involve the discharge of municipal or sanitary waste to surface waters, and the project does not propose non-storm water discharges that might require authorization by the Regional Water Quality Control Board (RWQCB).

Storm water management on the site will comply with RWQCB Municipal NPDES Permit requirements, including the incorporation of site design, source control, and treatment control Best Management Practices (BMPs).

14.1.2 303(d) Impairments

Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, could the project result in an increase in any pollutant for which the water body is already impaired?

No. The project is not immediately tributary to a water body listed as impaired on the CWA Section 303(d) list. The nearest impaired water body is in San Diego Bay, which is not listed as impaired at the mouth of the Otay River. San Diego Bay is located 18 miles downstream, and is isolated by the Otay Reservoir system (unless Otay Dam spills, no waters from Jamul Creek can reach San Diego Bay).

14.1.3 Polluted Runoff

Would the project provide substantial additional sources of polluted runoff?

No. The project does not represent a substantial additional source of polluted runoff. The project represents approximately 2 percent of the local hydrologic sub area. The project

includes site design and source control BMPs to prevent the generation of potential pollutants and to prevent exposure of storm water to pollutants. In addition, the project includes treatment control BMPs to treat polluted storm water runoff to the maximum extent practicable before it exits the site.

14.1.4 Water Quality Objectives

Could the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?

The project is not anticipated to cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses. The project includes site design and source control BMPs to prevent the generation of potential pollutants and to prevent exposure of storm water to pollutants. In addition, the project includes treatment control BMPs to treat polluted storm water runoff to the maximum extent practicable before it exits the site.



15 References

15.1 GENERAL REFERENCES

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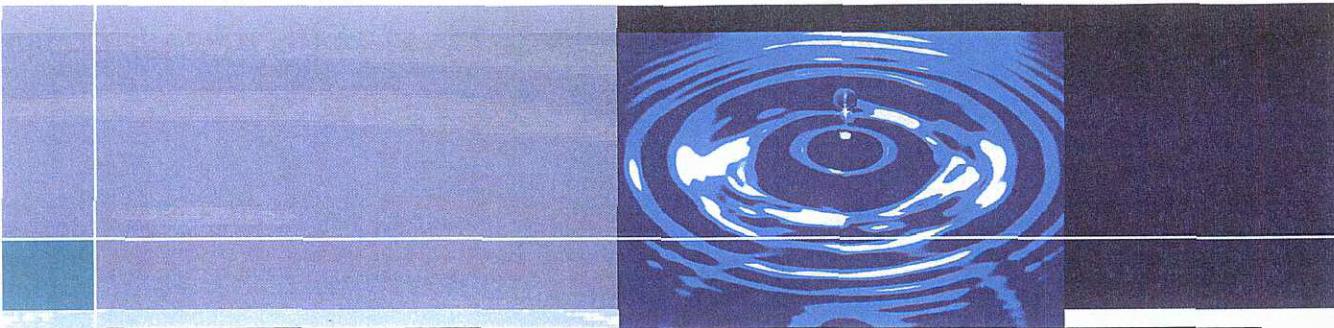
U.S. EPA, 2002. U.S. EPA. (January 28, 2002). "National Menu of Storm Water Best Management Practices for NPDES Phase II."

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15.2 PROJECT SPECIFIC REFERENCES

RBF Consulting, June 2006. *CEQA Preliminary Drainage Study: Peaceful Valley Ranch.* RBF JN 25-100796.001.

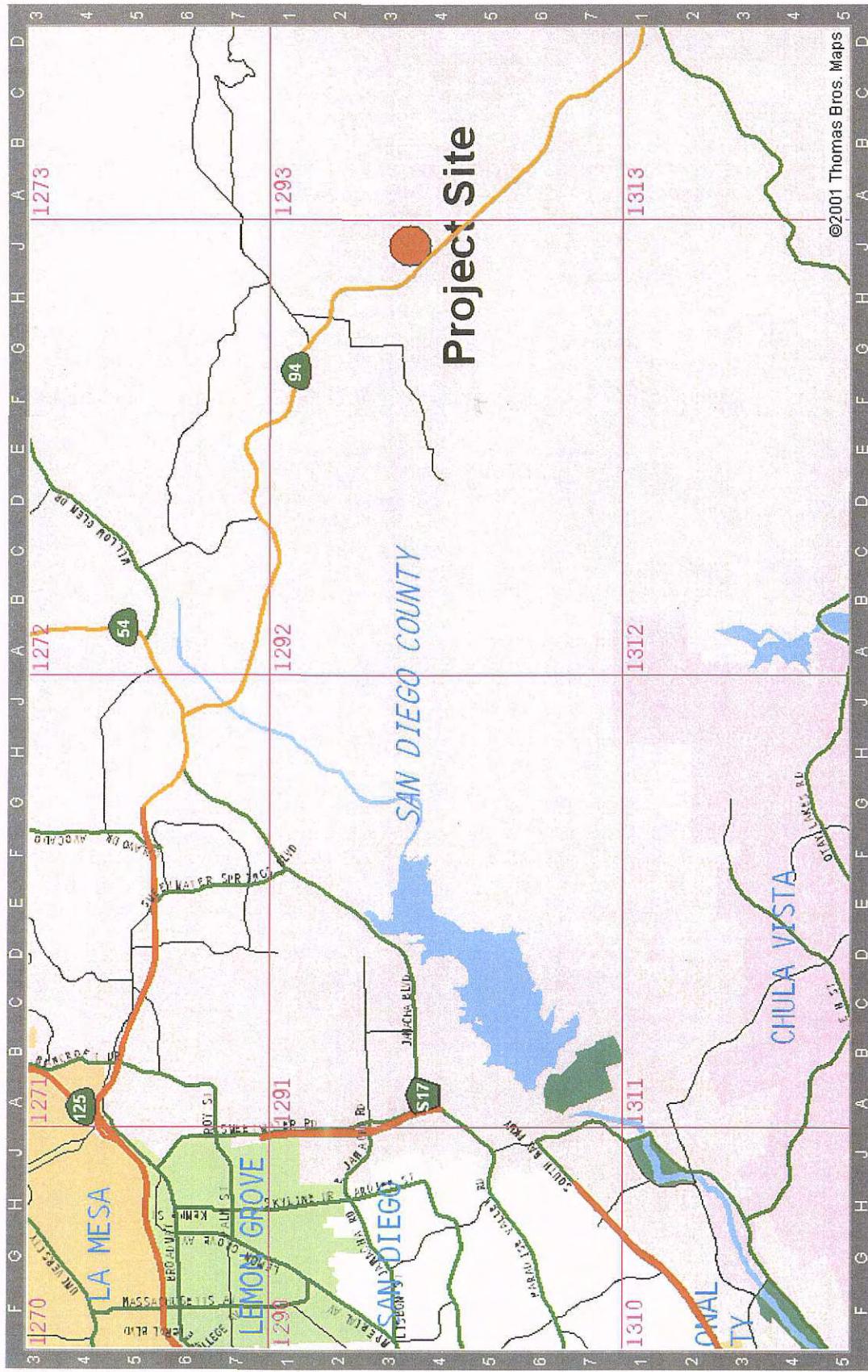
Wiedlin & Associates. April 11, 2005. *Evaluation of Potential High Regional Water Table Interference with Propose Septic Leach Fields for Peaceful Valley Ranch.* DEH No. VHO698.



ATTACHMENT A

Location Map

RBF
CONSULTING

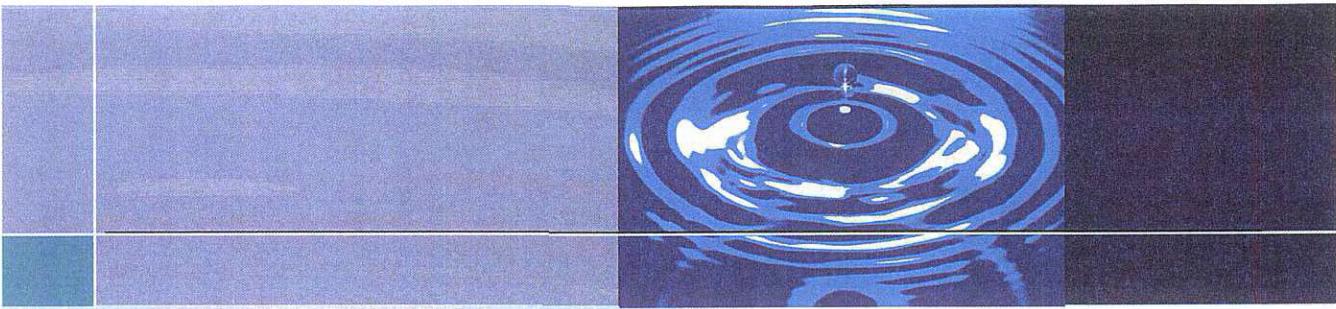


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RBF JN 25-100796 (April 24, 2007)

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RBF JN 25-100796 (April 24, 2007)

ATTACHMENT A

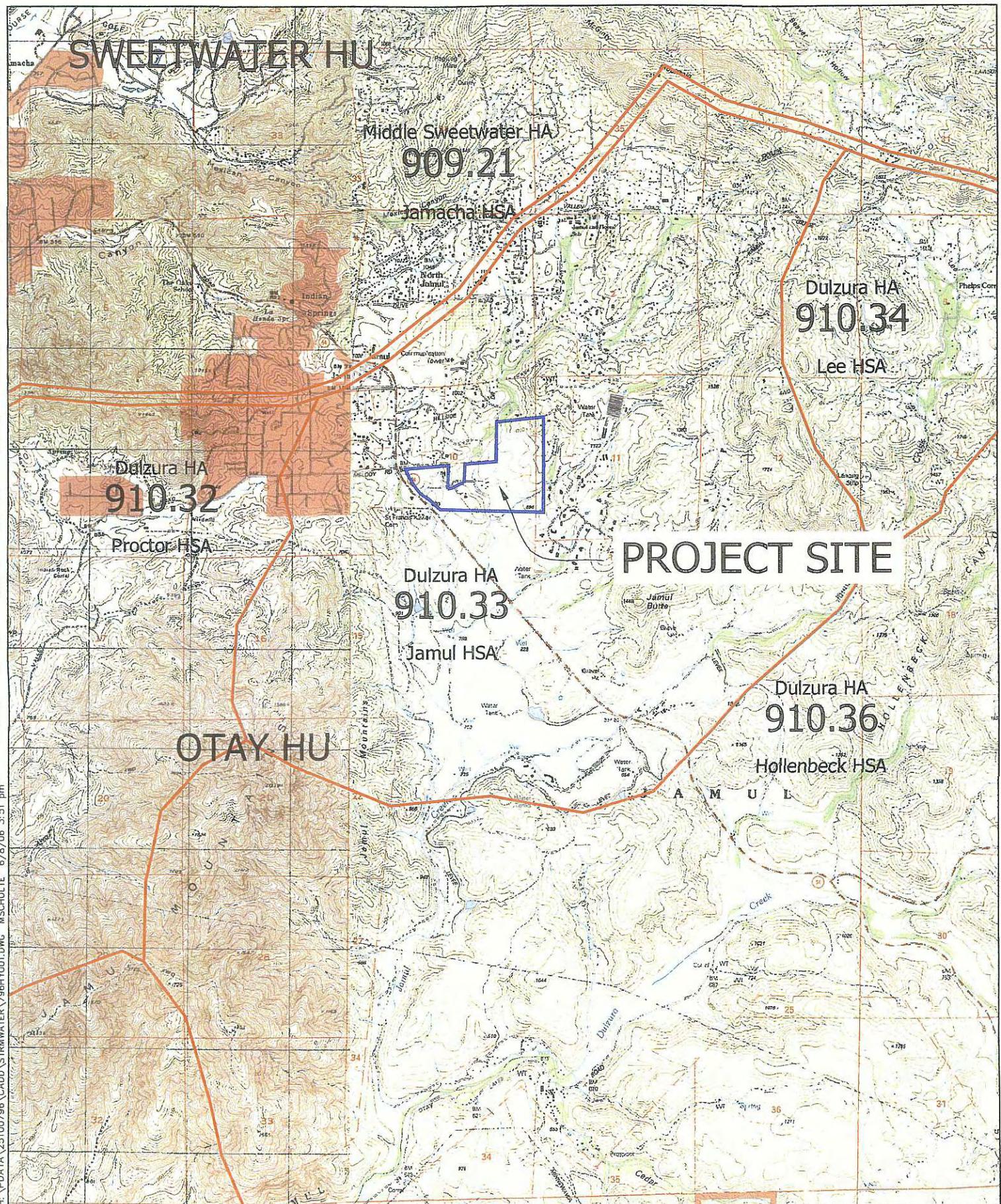


ATTACHMENT B

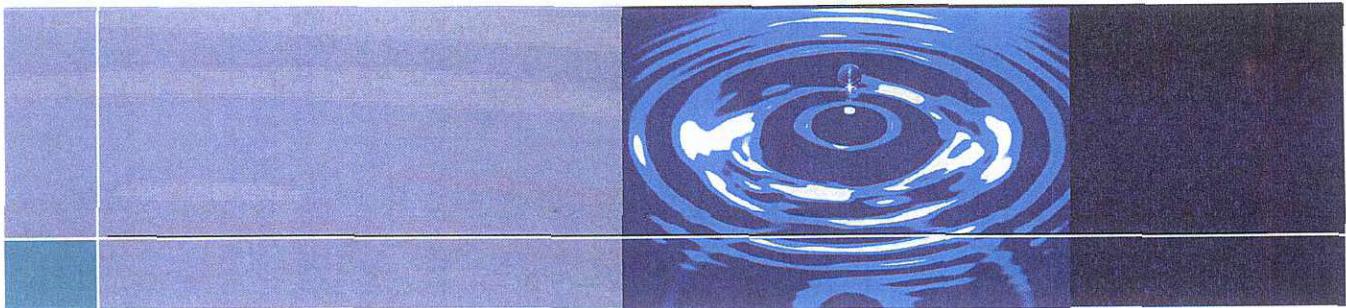
Project Site Map

RBF

CONSULTING



Peaceful Valley Ranch SWMP
Watershed Vicinity Map



ATTACHMENT C

Water Quality Monitoring Data

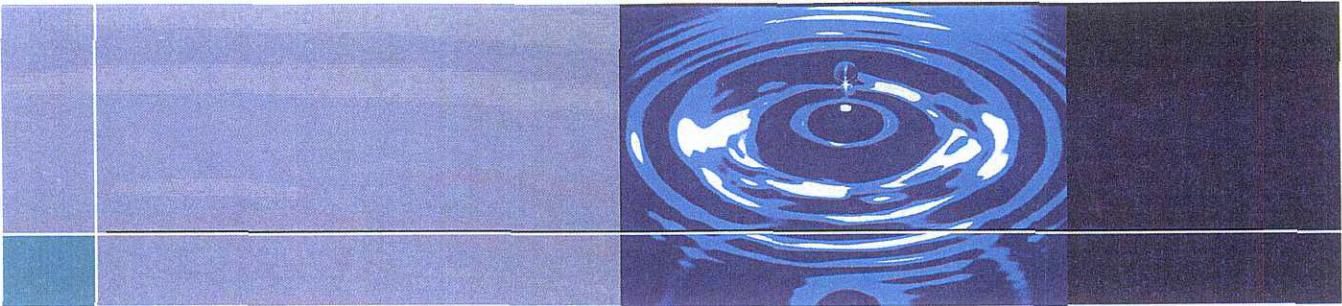
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Water Quality Monitoring Data

There are no relevant water quality monitoring data available for the project site.

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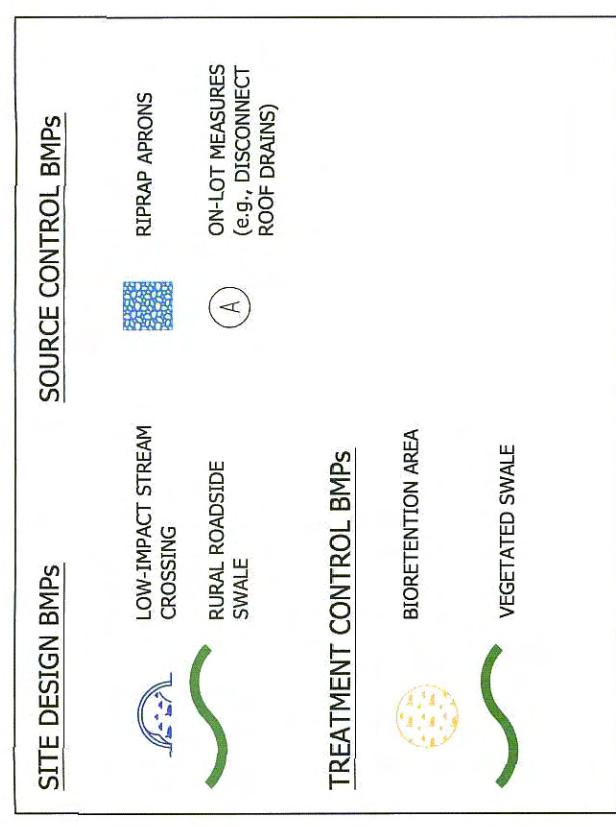


ATTACHMENT D

Treatment BMP Location Map

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CONSULTING

ORIGINAL IN COLOR



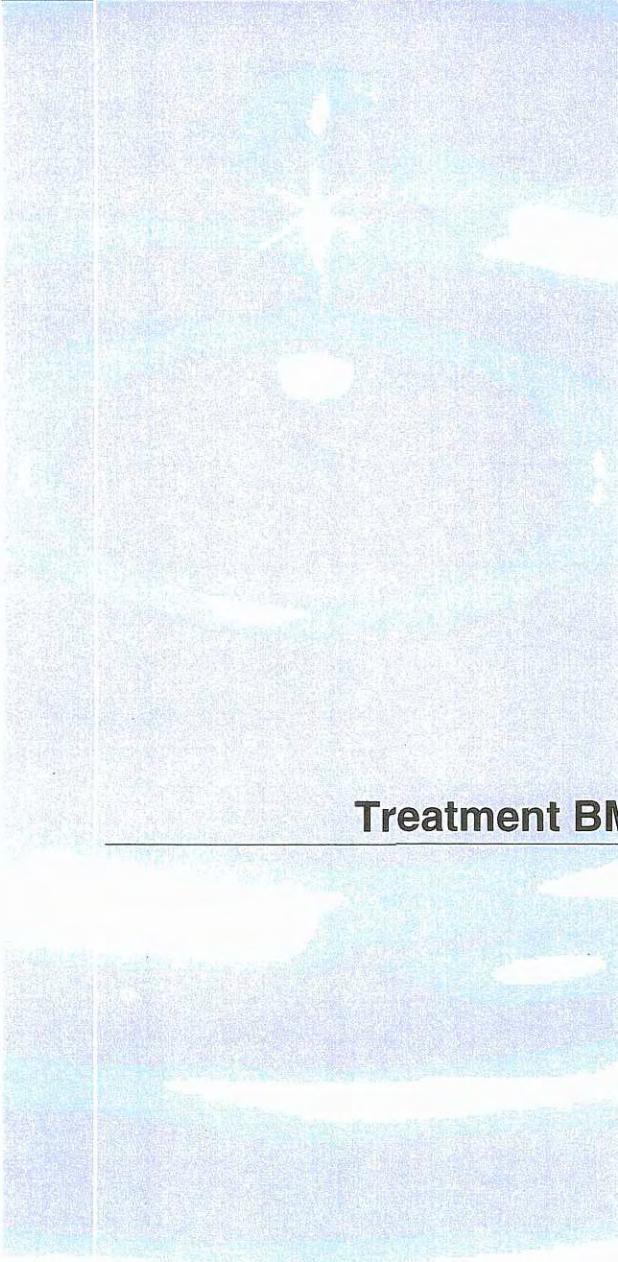
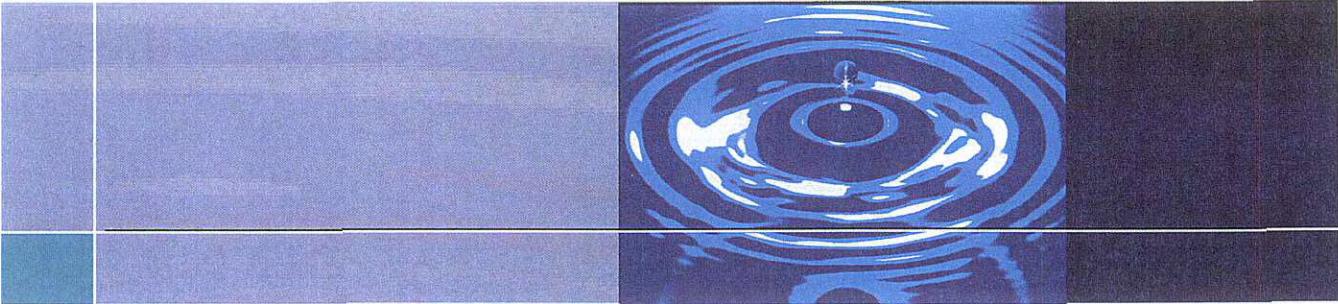
NOTE: BMP SITE MAP IS FOR ILLUSTRATION ONLY. PRIVATE ROAD SWALES AND RIPRAP SHALL NOT ENCROACH ON CALTRANS R.O.W.

NOTE: ALL BMP FACILITIES TO BE PLACED WITHIN EASEMENTS TO THE HOA WITH CONTINUING RIGHTS OF THE HOA TO MAINTAIN BMP FACILITIES

APN: 597-050-13, 597-060-02,
579-070-02, 579-070-07

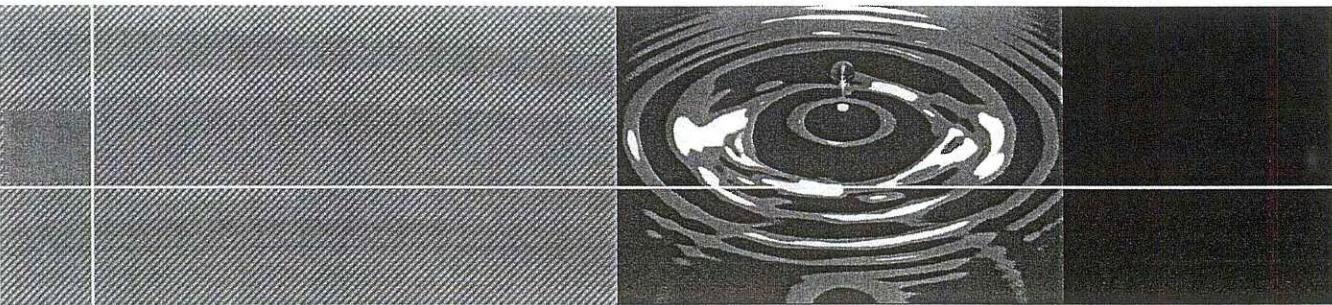
OWNER/APPLICANT:
PEACEFUL VALLEY RANCH, LLC
14131 HILLSIDE DRIVE
JAMUL, CA 91935

ILLUSTRATION ONLY -
NOT FOR CONSTRUCTION



ATTACHMENT E

Treatment BMP Data and Sizing Calculations



Precipitation Analysis

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RBF JN 25-100796.001

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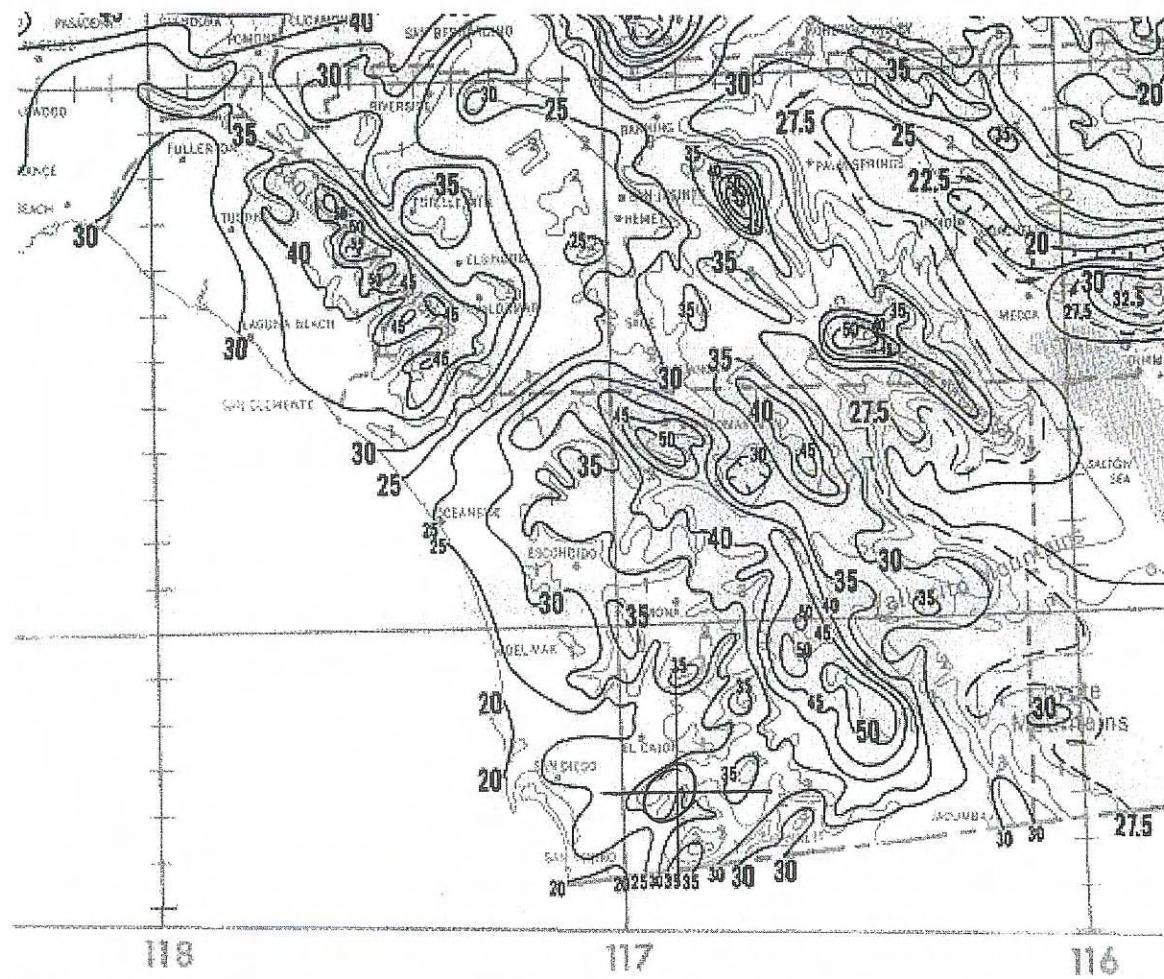


Figure 1. 100-year, 6-hour precipitation isopluvials in tenths of an inch for western San Diego County (from NOAA Atlas 2, Volume XI).

$$(P_6)_{100} = 3.1$$

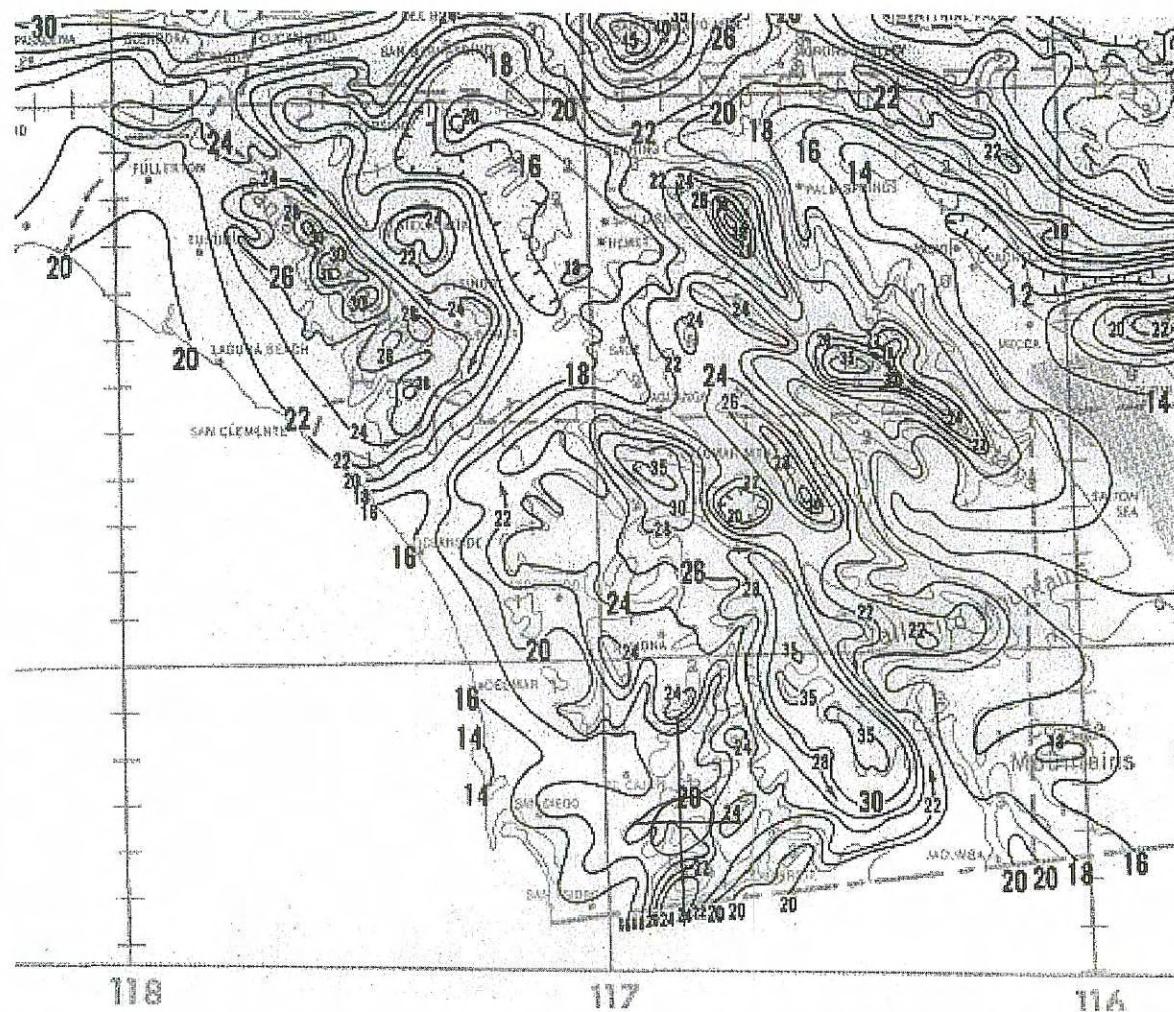
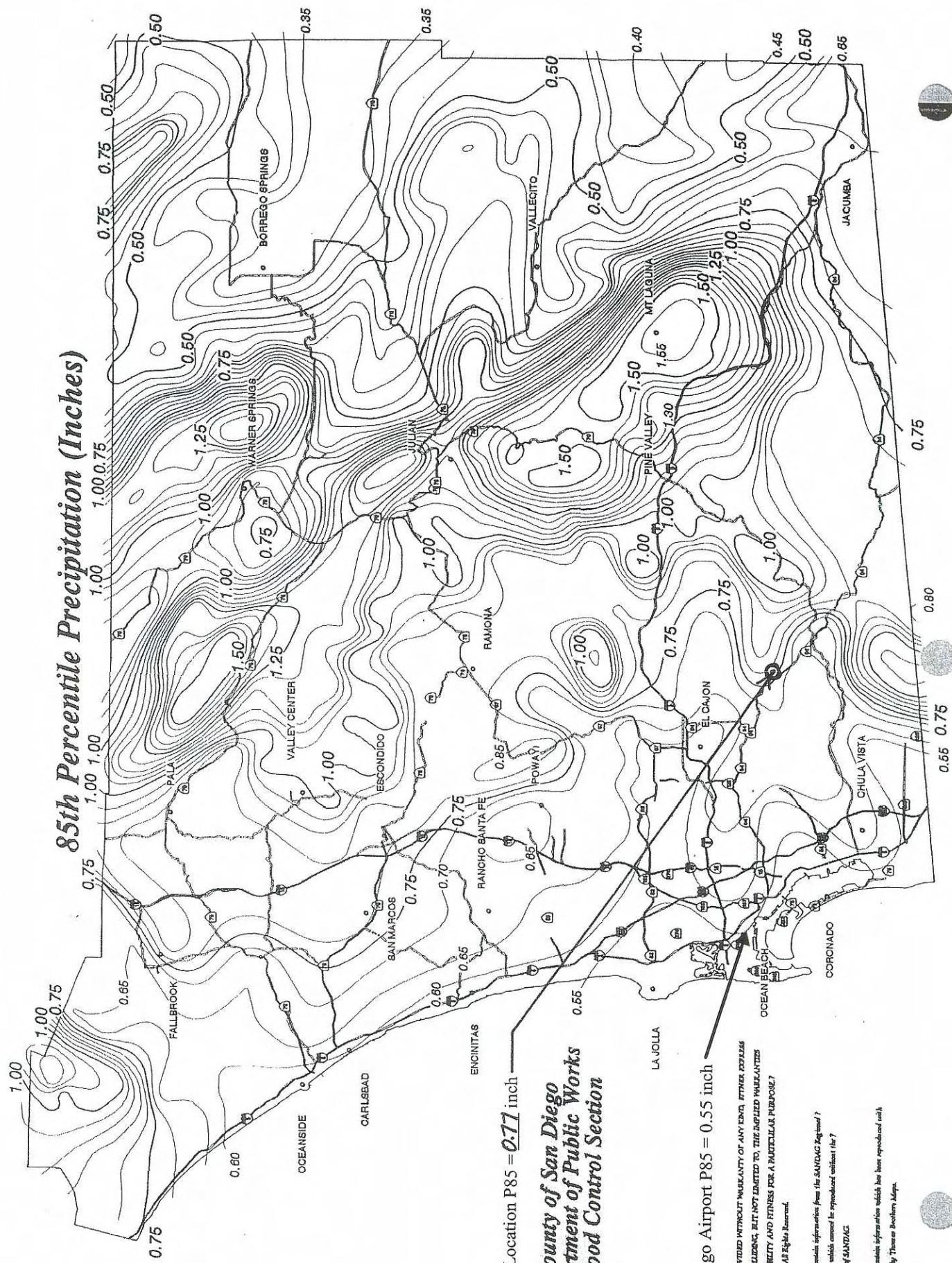


Figure 4. 10-year, 6-hour precipitation isopluvials in tenths of an inch for western San Diego County (from NOAA Atlas 2, Volume XI).

$$(P_6)_{100} = \frac{2.0}{\text{---}}$$

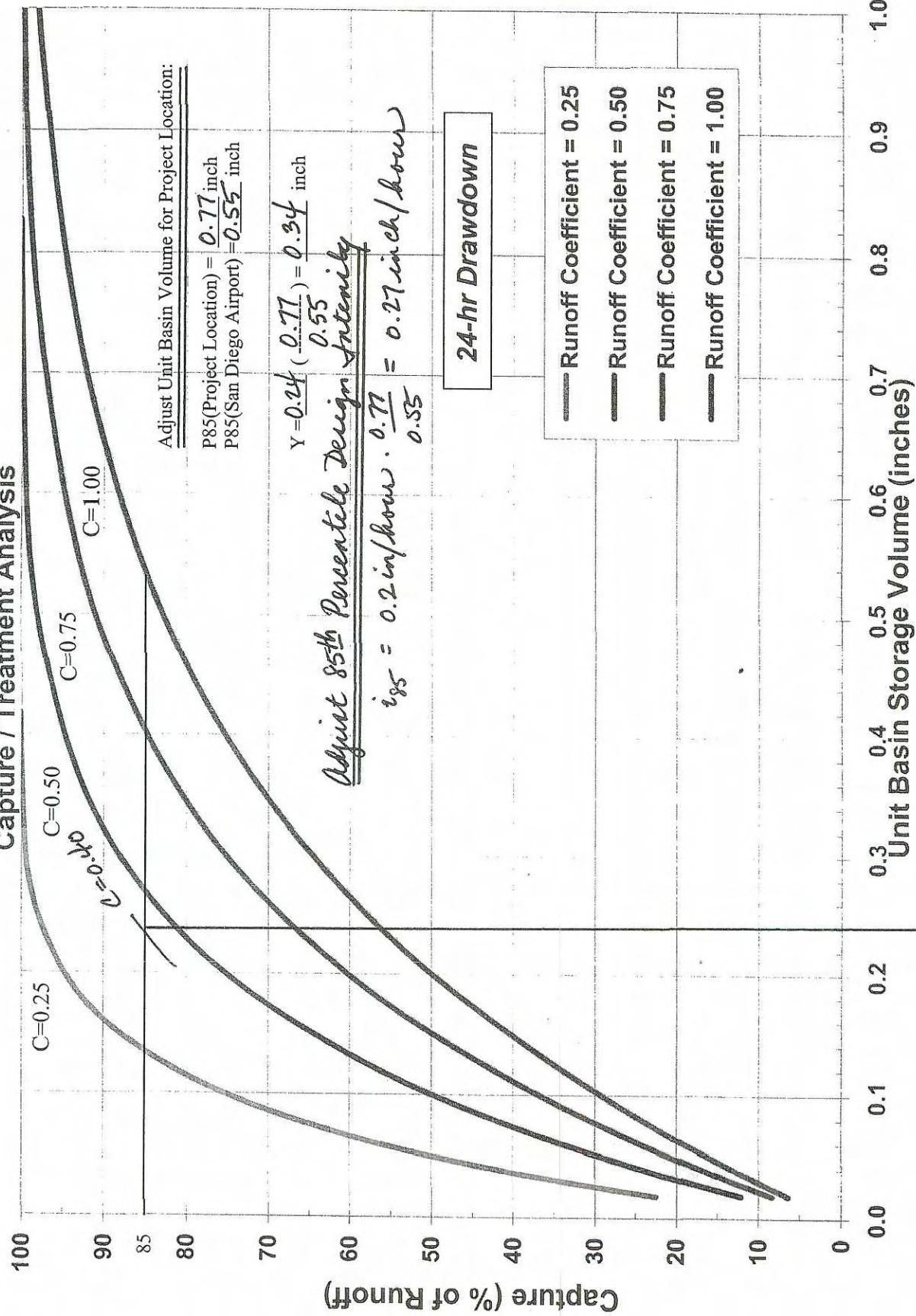


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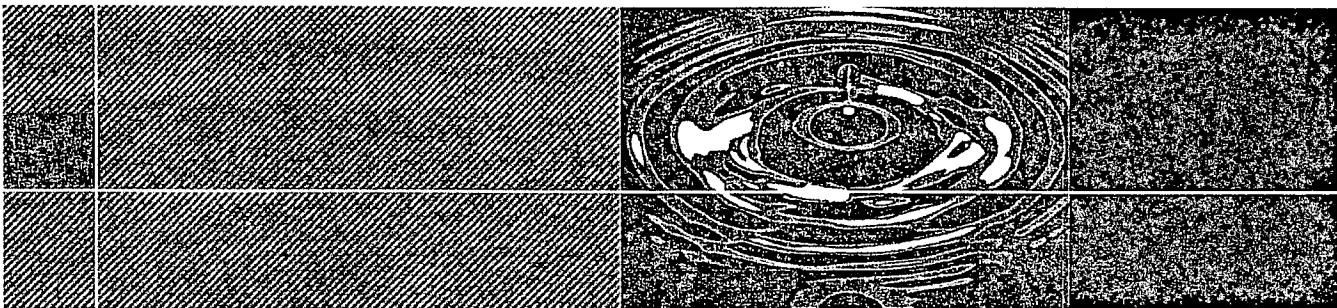
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San Diego WSO Airport (7740) - San Diego County, California Capture / Treatment Analysis



Source: California Stormwater Quality Association (2003), Stormwater Best Management Practice Handbook for New Development and Redevelopment.



Soils Information

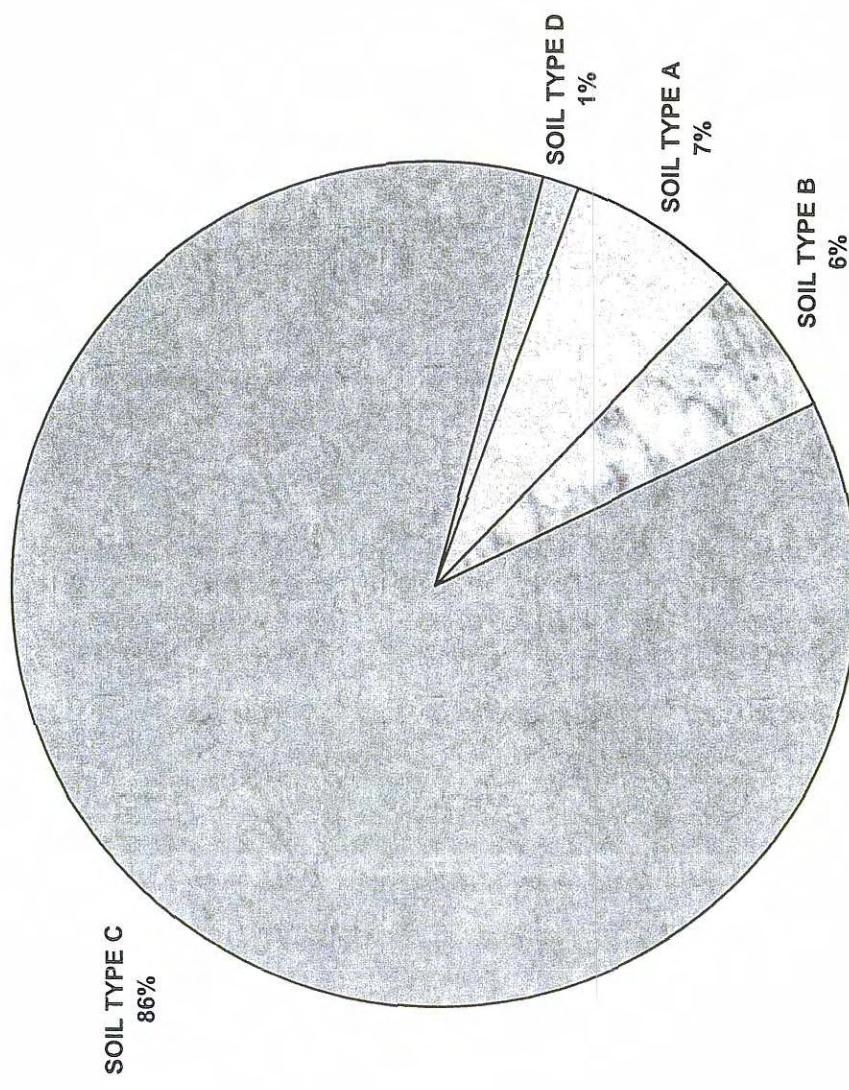
RBF

CONSULTING

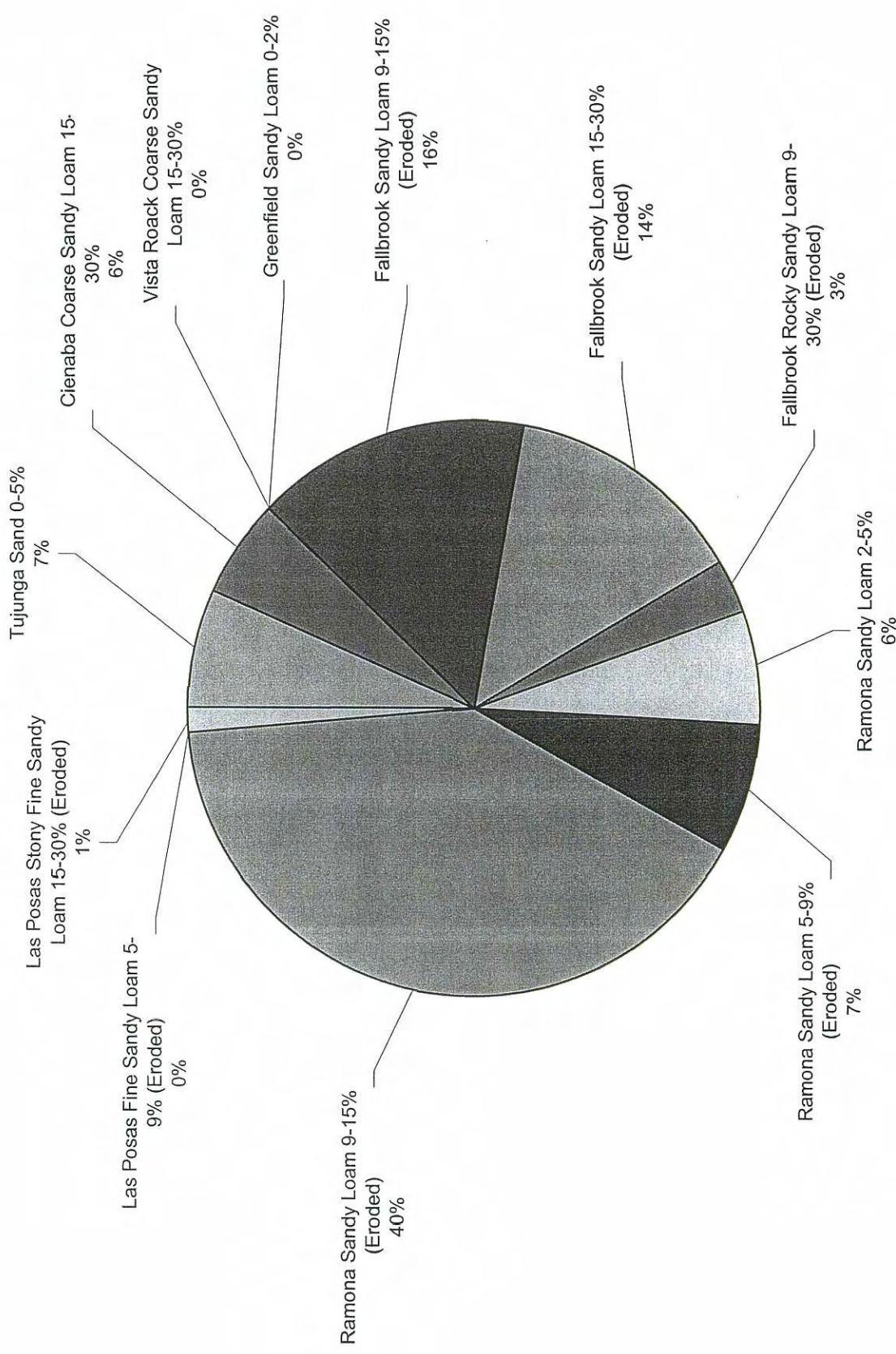
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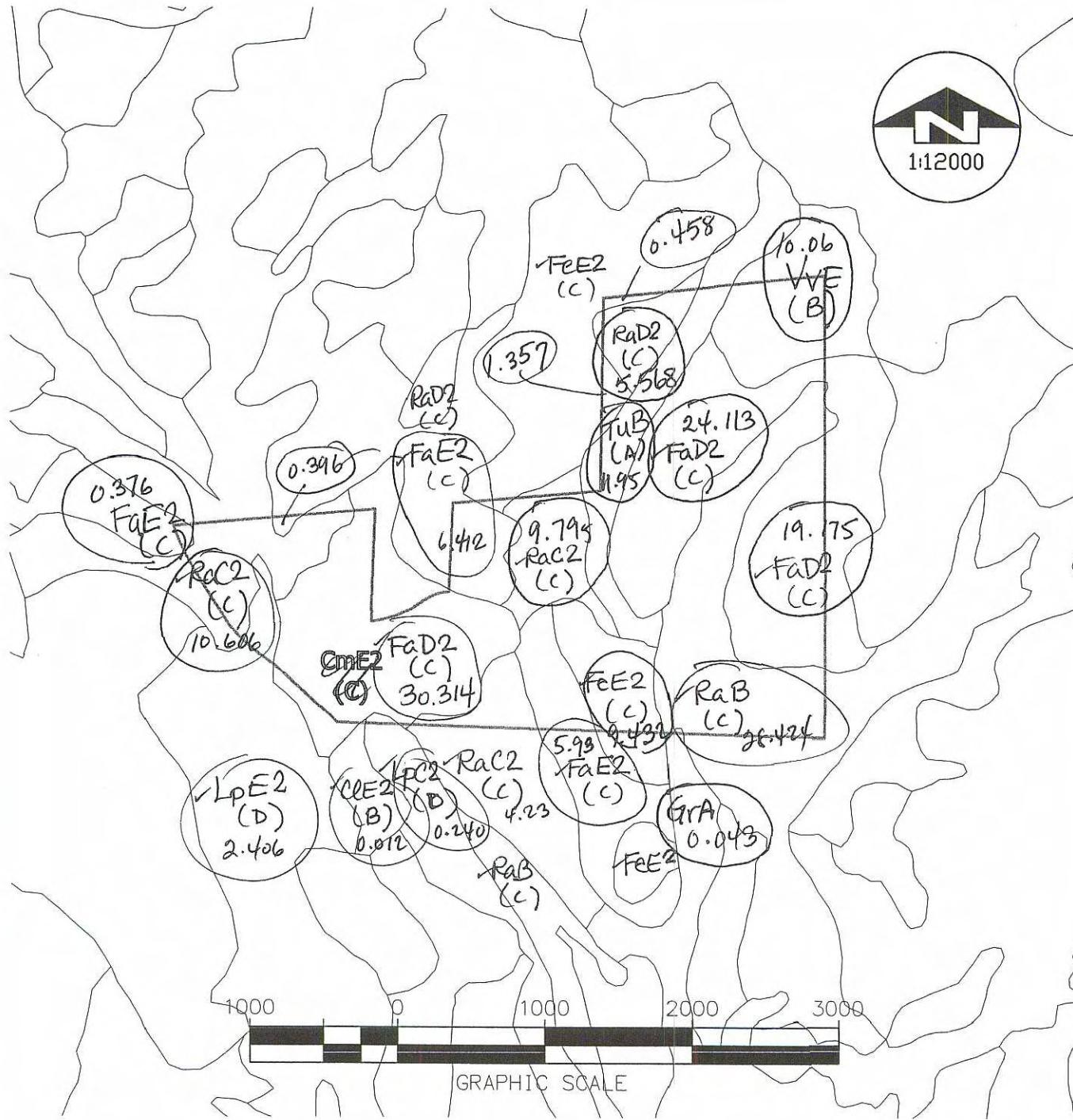
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Soil Summary					
Peaceful Valley Ranch (RBF JN 25-100796.001)					
Soil Name	Symbol	Hydrologic Soil Type	Erodibility	Area (acre)	Fraction
Tujunga Sand 0-5%	TuB	A	Severe	12.0	0.07
<i>SOIL TYPE A</i>				12.0	0.07
Cienaba Coarse Sandy Loam 15-30%	CIE2	B	Severe	10.0	0.06
Greenfield Sandy Loam 0-2%	GrA	B	Severe	0.04	0.00
Vista Roack Coarse Sandy Loam 15-30%	VvE	B	Moderate	0.01	0.00
<i>SOIL TYPE B</i>				10.1	0.06
Fallbrook Sandy Loam 9-15% (Eroded)	FaD2	C	Severe	28.4	0.16
Fallbrook Sandy Loam 15-30% (Eroded)	FaE2	C	Severe	24.6	0.14
Fallbrook Rocky Sandy Loam 9-30% (Eroded)	FeE2	C	Severe	5.5	0.03
Ramona Sandy Loam 2-5%	RaB	C	Severe	11.5	0.06
Ramona Sandy Loam 5-9% (Eroded)	RaC2	C	Severe	13.1	0.07
Ramona Sandy Loam 9-15% (Eroded)	RaD2	C	Severe	73.6	0.41
<i>SOIL TYPE C</i>				156.7	0.86
Las Posas Fine Sandy Loam 5-9% (Eroded)	LpC2	D	Severe	0.2	0.00
Las Posas Stony Fine Sandy Loam 15-30% (Erode	LpE2	D	Severe	2.3	0.01
<i>SOIL TYPE D</i>				2.5	0.01
TOTAL				181.3	1.00



Soil Classification





MAP LEGEND

PROJECT SITE

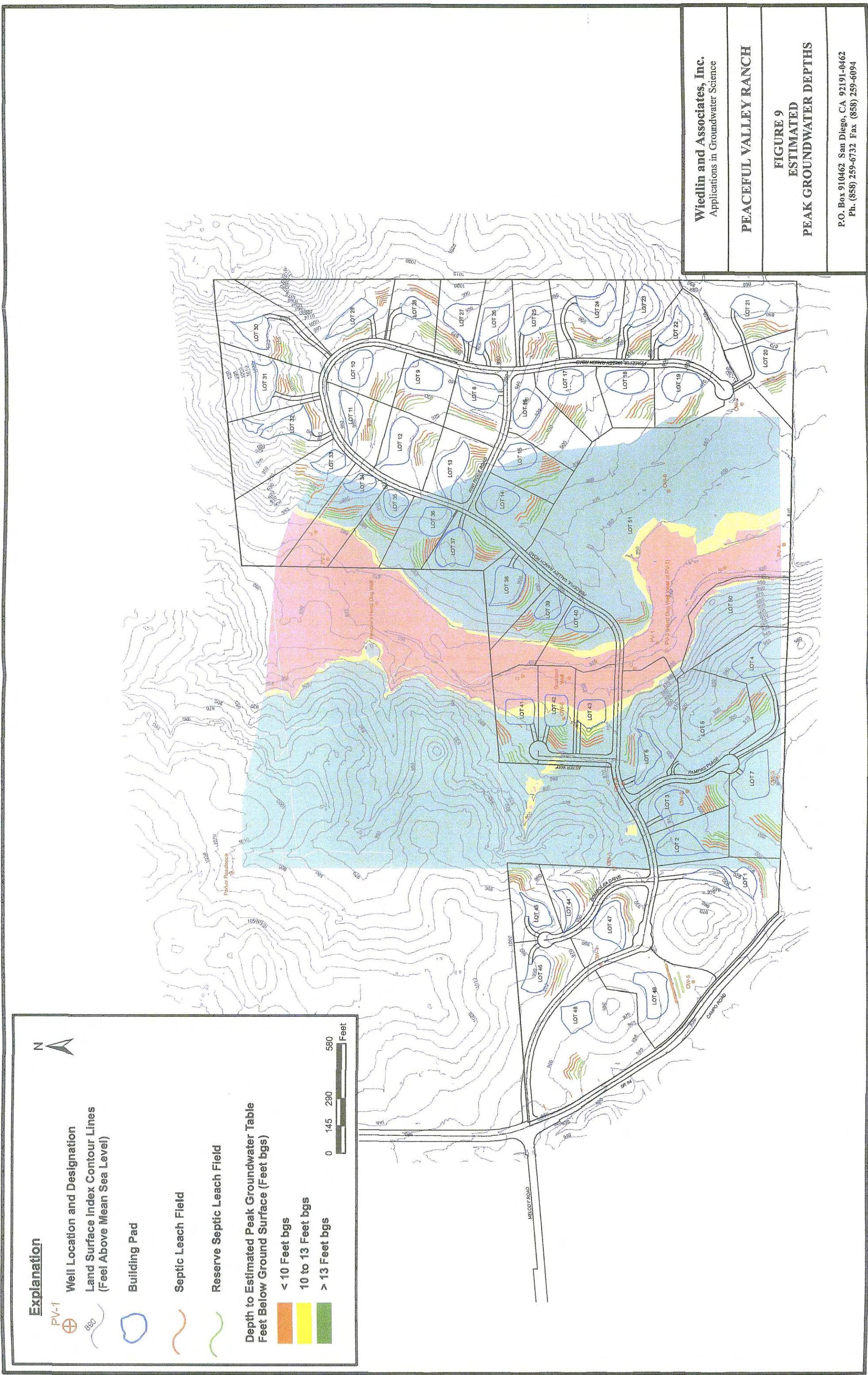
ON-SITE FLOW DIRECTION

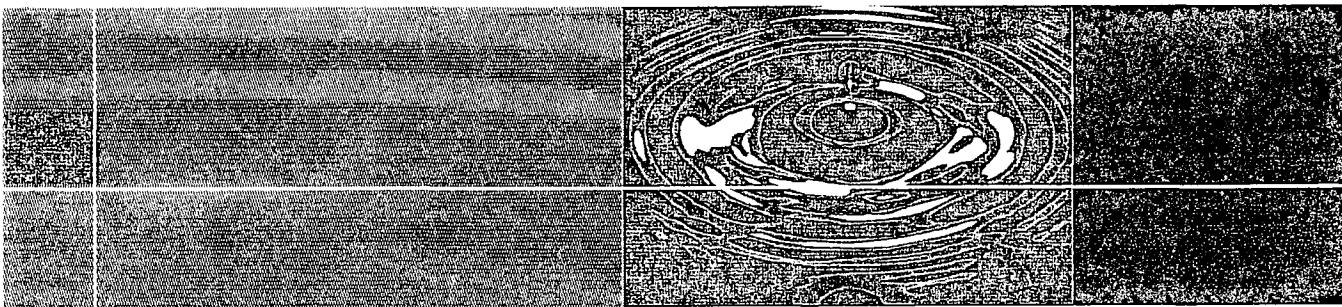
EXHIBIT D HYDROLOGIC SOILS MAP

PEACEFUL VALLEY RANCH
RBF JN 25-100796.001

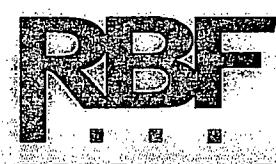
RBF
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PLANNING ■ DESIGN ■ CONSTRUCTION
9755 CLAIREFONT MESA BOULEVARD, SUITE 100
SAN DIEGO, CALIFORNIA 92124-1324
858.614.5000 ■ FAX 858.614.5001 ■ www.RBF.com





Vegetation Information

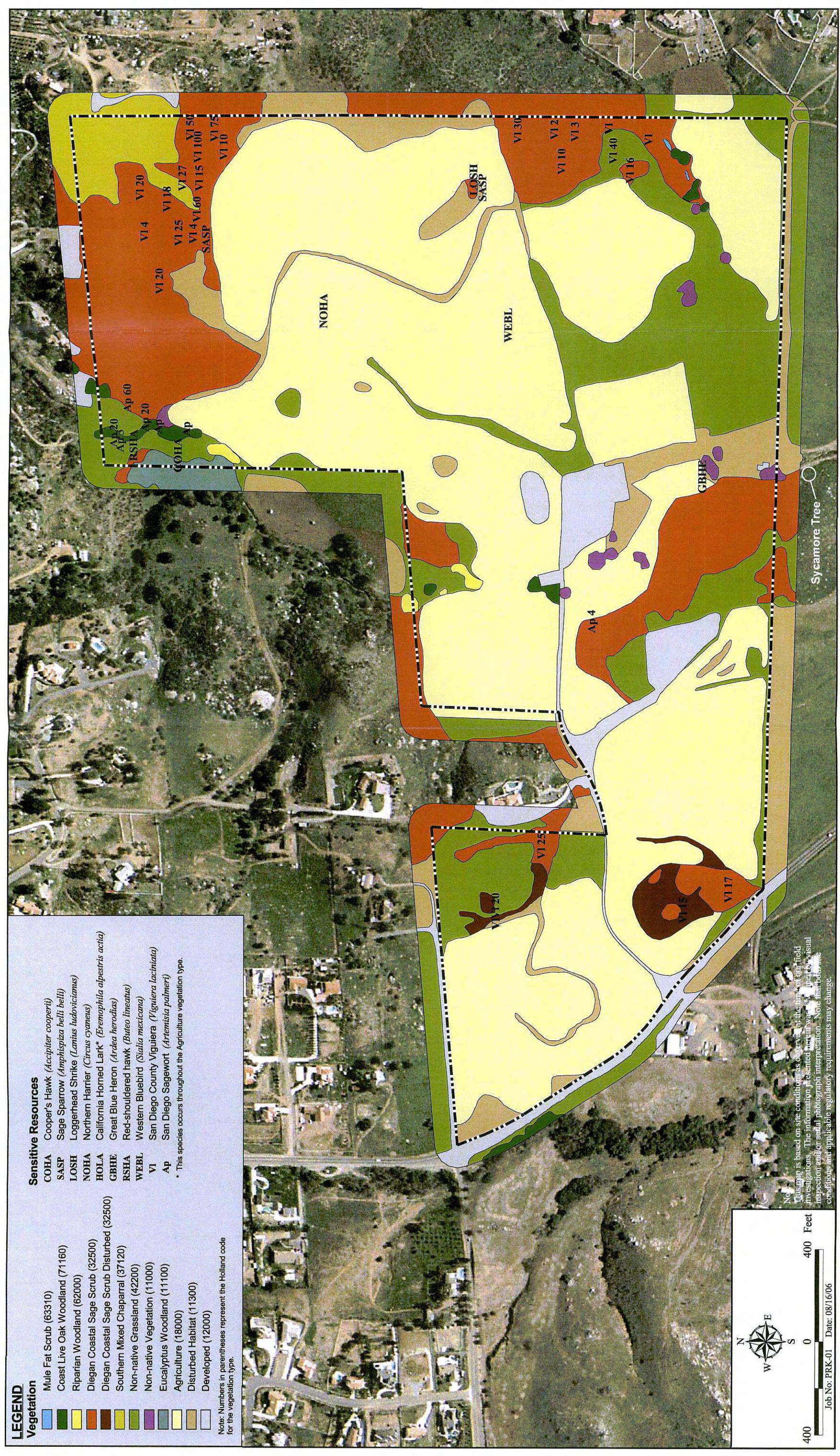


RBF IN 25-100796-001

<http://data25/00/96/swmp/nsword/796wa002.doc>

Vegetation Map

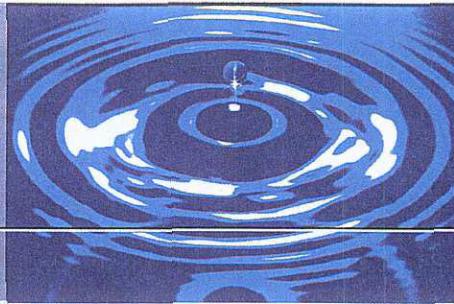
Peaceful Valley Ranch



Onsite Vegetation Communities

Vegetation Community*	Acreage**
Tier I:***	
Coast live oak woodland (71160)	0.9
Riparian woodland (62000)	0.4
Mule fat scrub (63310)	0.03
Tier II:	
Diegan coastal sage scrub (32500)	27.4
Diegan coastal sage scrub – disturbed	2.2
Tier III:	
Southern mixed chaparral (37120)	3.1
Non-native grassland (42200)	25.0
Other:	
Non-native vegetation	0.9
Eucalyptus woodland (11100)	0.4
Disturbed habitat (11300)	9.5
Agriculture (18000)	106.0
Developed (12000)	5.5
Total:	181.31
<small>*Categories and codes are from Holland (1986) and Oberbauer (1996). ** Total acreage equals 181.33 if column is added due to rounding. *** Tier levels per County Biological Mitigation Ordinance</small>	

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ATTACHMENT F

Treatment BMP Maintenance Program



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Vegetated Swale Hydraulic Design - Part III-A (Q_{100} Minimum Dimensions)
Peaceful Valley Ranch (RBF JN 25-100796.001)

LOCATION	Design Swale Base Width*	Swale Side Slope	100-Year Peak Flow Depth	Swale Depth w/ 6" Freeboard	Swale Top Width w/ 6" Freeboard	Swale Slope	Roughness Coefficient	Section Factor	Required Flow Capacity	Actual Flow Capacity	Difference
b	z	d_{100}	D	T	S	n	$(AR)^{2/3}$	$Q_{MIN}=Q_{100}$	Q_{CAP}	$\Delta Q=Q_{CAP}^n - Q_{MIN}$	
(ft)	(H:V)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft ^{0.63})	(cfs)	(cfs)	(cfs)	
Polo North	4.50	3.00	1.32	2.00	16.50	0.020	0.035	10.54	63.5	63.5	0.00
Polo West	10.00	3.00	1.46	2.00	22.00	0.005	0.035	22.16	66.7	66.7	0.00
Polo East	1.00	3.00	1.15	2.00	13.00	0.010	0.035	4.12	17.6	17.6	0.00

* Use Calc. Swale Base Width Rounded Up to Nearest 3" or 1ft Whichever is Larger.

Vegetated Swale Hydraulic Design - Part II-A (Q_{10} Minimum Dimensions)
 Peaceful Valley Ranch (RBF JN 25-100796.001)

LOCATION	Design Swale Base Width*	Swale Side Slope	10-Year Peak Flow Depth	Swale Depth w/ 6" Freeboard	Swale Top Width w/ 6" Freeboard	Swale Slope	Roughness Coefficient	Section Factor	Required Flow Capacity	Actual Flow Capacity	Difference
	b	z	d_{10}	D	T	S	n	$(AR^{2/3})$	$Q_{MIN}=Q_{10}$	Q_{CAP}	$\Delta Q=Q_{CAP}-Q_{MIN}$
	(ft)	(H:V)	(ft)	(ft)	(ft)	(ft/ft)		(ft ^{8/3})	(cfs)	(cfs)	(cfs)
Polo North	4.50	3.00	1.04	2.00	16.50	0.020	0.035	6.80	41.0	41.0	0.00
Polo West	10.00	3.00	1.13	2.00	22.00	0.005	0.035	14.30	43.0	43.0	0.00
Polo East	1.00	3.00	0.94	1.50	10.00	0.010	0.035	2.66	11.3	11.3	0.00

* Use Calc. Swale Base Width Rounded Up to Nearest 3" or 1ft Whichever is Larger

Vegetated Swale Hydraulic Design - Part I (Obtain Proper Treatment Flow Depth)
Peaceful Valley Ranch (RBF JN25-100796.001)

RBF Consulting
10/20/2003 1:14 PM

Site Constraints

Peaceful Valley Ranch (BRE #N 25-100796 001)

Water Quality Design Treatment Flow Rate
Peaceful Valley Ranch (RBF-JN 25-100796.001)

LOCATION	Rational Method Coefficient	Tributary Area		Water Quality Treatment Flow Rate	10-Year 6-Hour Rainfall	100-Year 6-Hour Rainfall	Time of Concentration	10-Year Rain Intensity*	100-Year Rain Intensity*	10-Year Peak Flow Rate	100-Year Peak Flow Rate
C	A	i_{85}	Q_{wq}	$(P_6)_{10}$	$(P_6)_{100}$	t_c	i_{10}	i_{100}	Q_{10}	Q_{100}	
		(in/hr)	(cfs)	(in)	(in)	(min)	(in/hr)	(in/hr)	(cfs)	(cfs)	
Polo North	0.40	51.70	0.27	5.64	2.00	3.10	22.8	1.98	3.07	40.95	63.48
Polo West	0.40	54.80	0.27	5.98	2.00	3.10	23.1	1.96	3.04	43.04	66.72
Polo East	0.40	10.10	0.27	1.10	2.00	3.10	13.3	2.80	4.35	11.33	17.56
			0.27		2.00	3.10			#VALUE!	#VALUE!	
			0.27		2.00	3.10			#VALUE!	#VALUE!	

BASIC DATA WORKSHEET - VEGETATED SWALE DESIGN WORKSHEET

Job Name	Peaceful Valley Ranch	
Job Number	25-100796.001	
Engineer	MAS	

85th Percentile Precipitation (Project Site), $(P_{85})_{\text{SITE}}$	0.75	in
85th Percentile Precipitation (San Diego Airport), $(P_{85})_{\text{AIRPORT}}$	0.55	in
Project Location Adjustment Factor, $(P_{85})_{\text{SITE}}/(P_{85})_{\text{AIRPORT}}$	1.36	
Water Quality Design Intensity, i_{85}	0.27	in/hr
10-Year, 6-Hour Precipitation (Project Site) $(P_6)_{10}$	2.00	in
100-Year, 6-Hour Precipitation (Project Site) $(P_6)_{100}$	3.10	in

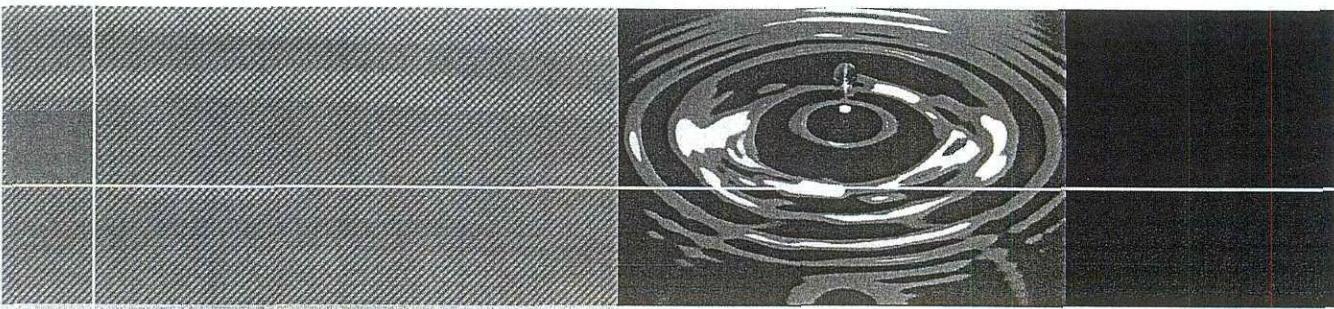
COMPARISON OF WATERSHED AREAS			
Peaceful Valley Ranch (RBF JN 25-1-00796.001)			
	<i>Area (acres)</i>	7,141	181
Jamul HSA 910.33	7,141	100%	-
Property	181	3%	100%
Impervious Area (Estimate)	15.6	< 1%	9%
			100%

Impervious Cover Worksheet

Peaceful Valley Ranch (RBF JN 25-100796.001)

Coverage	Existing Condition		Proposed Condition		Change (%)
	(acre)	(%)	(acre)	(%)	
Impervious Area					
Buildings*	0.17	0%	8.78	5%	+5%
Paved Area**	0.23	0%	6.83	4%	+4%
Subtotal Impervious Area	0.40	0%	15.61	9%	+8%
Pervious Area					
Landscaped Area	0.00	0%	0.00	0%	0
Unimproved Area	180.90	100%	165.69	91%	-15.21
Subtotal Pervious Area	180.90	100%	165.69	91%	-15.21
Total	181.30	100%	181.30	100%	0

* Assume 7500 sf per residential unit; ** Assume 9300 if of 32 ft wide roadway.



Impervious Area Analysis

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Bioretention Area Part I - with Sand Bed
Peaceful Valley Ranch/RBE IN 25-100796-001

Bioretention Area Part I - No Sand Bed
Peaceful Valley Ranch (RBF JN 25-100796.001)

* Round up to nearest 5 ft.

Bioretention Area Calculation Worksheet

Peaceful Valley Ranch (RBF JN 25-100796 001)

Water Quality Design Treatment Volume
Peaceful Valley Ranch (RBF-1N 25-100796-001)

BASIC DATA WORKSHEET - BIORETENTION AREA DESIGN WORKSHEET

Job Name	Peaceful Valley Ranch	
Job Number	25-100796.001	
Engineer	MAS	

85th Percentile Precipitation (Project Site), $(P_{85})_{\text{SITE}}$	0.75	in
85th Percentile Water Quality Runoff Yield (Airport), Y_{85}	0.24	in
85th Percentile Precipitation (San Diego Airport), $(P_{85})_{\text{AIRPORT}}$	0.55	in
Project Location Adjustment Factor, $(P_{85})_{\text{SITE}}/(P_{85})_{\text{AIRPORT}}$	1.36	
Water Quality Design Intensity, i_{85}	0.27	in/hr
85th Percentile Water Quality Runoff Yield (Project Site), Y_{85}	0.33	in
10-Year, 6-Hour Precipitation (Project Site) $(P_6)_{10}$	2.00	in
100-Year, 6-Hour Precipitation (Project Site) $(P_6)_{100}$	3.10	in

Vegetated Swale Hydraulic Design - Part IV (Cost Estimate)						
Peaceful Valley Ranch (RBF JN'25-100796.001)						
LOCATION	Unit Construction Cost	Swale Area	Total Construction Cost	Unit Annual Maintenance Cost	Swale Length	Total Annual Maintenance Cost
Polo North	\$ 0.50	7,425 ft ²	\$ 3,713	\$ 0.75	450 ft	\$ 338
Polo West	\$ 0.50	5,500	\$ 2,750	\$ 0.75	250	\$ 188
Polo East	\$ 0.50	9,295	\$ 4,648	\$ 0.75	715	\$ 536
TOTAL	22,220	\$ 11,110		\$ 20,015		\$ 15,011

Treatment BMP Maintenance Program

Maintenance Program for Filter Insert(s).

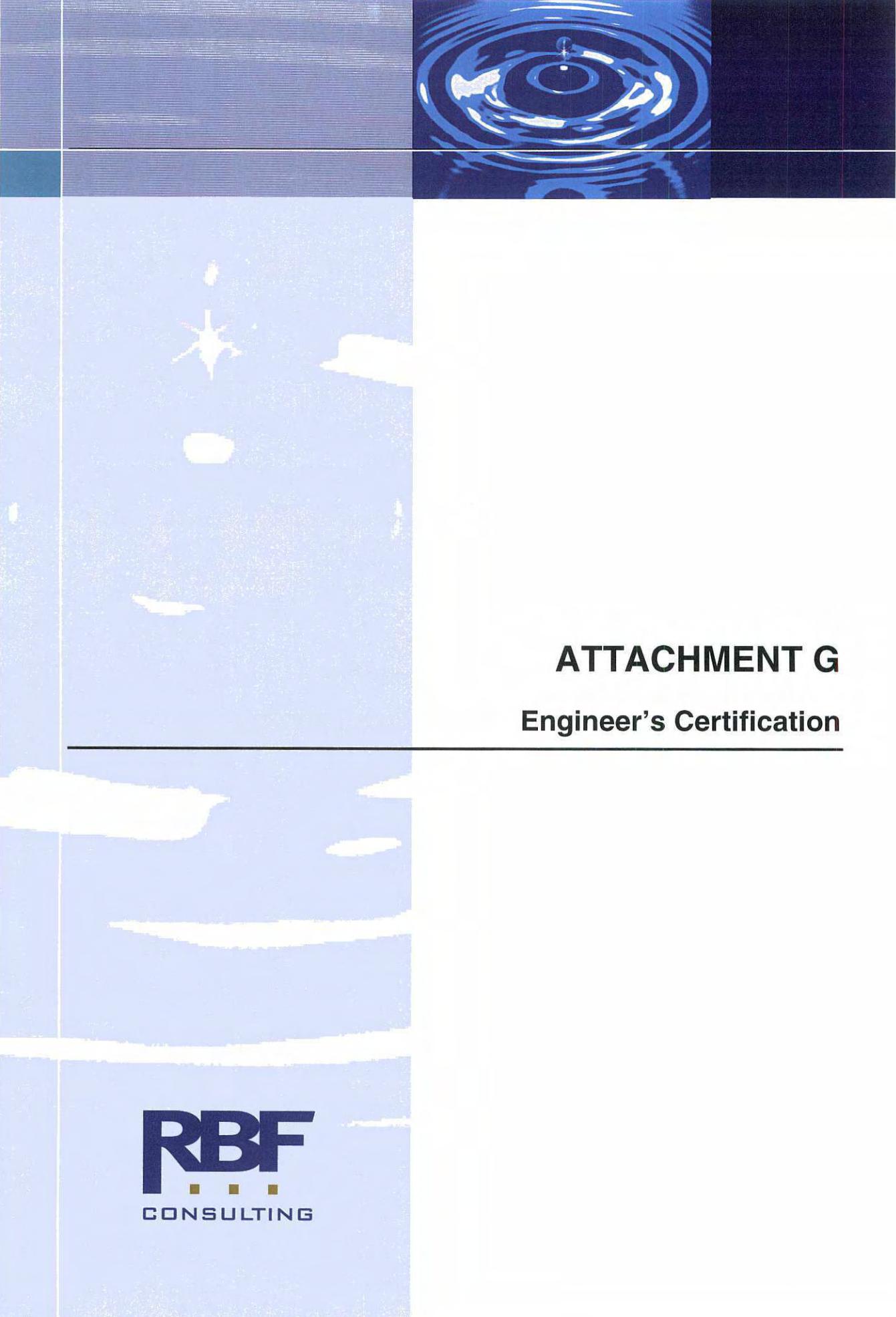
Inspection Frequency/Indications:	First Year <input type="checkbox"/> Before wet season begins (October); <input type="checkbox"/> After rainfall events greater than 0.5 inches; <input type="checkbox"/> After wet season (May). Subsequent Years <input type="checkbox"/> Before wet season begins (October)
Maintenance Indications	Maintenance Activities
<input type="checkbox"/> Trash and debris interfering with function of insert	<input type="checkbox"/> Remove trash and debris
<input type="checkbox"/> Broken or damage insert	<input type="checkbox"/> Repair inlet insert
<input type="checkbox"/> Sediment clogging	<input type="checkbox"/> Remove sediment
<input type="checkbox"/> Insert adsorbent material at capacity	<input type="checkbox"/> Replace adsorbent material when it has reached capacity or at an intervals recommended by manufacturer
Waste Disposal	Sediment, other pollutants, and all other waste shall be properly disposed of in a licensed landfill or by another appropriate disposal method in accordance with local, state, and federal regulations.

Maintenance Program for Riprap Energy Dissipators

Inspection Frequency/Indications:	First Year <input type="checkbox"/> Before wet season begins (October); <input type="checkbox"/> After rainfall events greater than 0.5 inches; <input type="checkbox"/> After wet season (May). Subsequent Years <input type="checkbox"/> Before wet season begins (October)
Maintenance Indications	Maintenance Activities
<input type="checkbox"/> Damage to sill, headwall, or other structures	<input type="checkbox"/> Repair sill, headwall, or other structures
<input type="checkbox"/> Riprap washed away	<input type="checkbox"/> Replace riprap
<input type="checkbox"/> Over-grown vegetation, emergent woody vegetation and/or weeds	<input type="checkbox"/> Trim vegetation to 6 inches, remove emergent woody vegetation and weeds
<input type="checkbox"/> Sediment accumulation over 3 inches	<input type="checkbox"/> Remove sediment accumulation
<input type="checkbox"/> Trash and litter present in riprap	<input type="checkbox"/> Remove trash and debris
Waste Disposal	Sediment, other pollutants, and all other waste shall be properly disposed of in a licensed landfill or by another appropriate disposal method in accordance with local, state, and federal regulations.

Maintenance Program for Bioretention Area

Inspection Frequency/Indications:	<u>First Year</u> <input type="checkbox"/> Before wet season begins (October); <input type="checkbox"/> After rainfall events greater than 0.5 inches; <input type="checkbox"/> After wet season (May). <u>Subsequent Years</u> <input type="checkbox"/> Annually before wet season begins (October) <input type="checkbox"/> After rainfall events greater than 1.0 inch
Maintenance Indications Connections	Maintenance Activities Connections
<input type="checkbox"/> Damage to inlet/outlet, sideslopes, headwall, or other structures <input type="checkbox"/> Over-grown vegetation, emergent woody vegetation and/or weeds <input type="checkbox"/> Sediment accumulation over 3 inches <input type="checkbox"/> Trash, debris, and vegetative litter <input type="checkbox"/> Rodents or other vectors	<input type="checkbox"/> Repair inlet/outlet structures, side slopes, fences, or other structural elements as needed to maintain performance of the facility. <input type="checkbox"/> Trim vegetation to average height of 12 inches and remove trimmings. <input type="checkbox"/> Remove emergent trees and other vegetation that are not part of bioretention basin plan and weeds <input type="checkbox"/> Re-seed and re-plan barren areas prior to rainy season <input type="checkbox"/> Install erosion blanket on barren spots if re-vegetation is not successful <input type="checkbox"/> Remove sediment accumulation at or near plant height <input type="checkbox"/> Remove trash, debris, and vegetative litter <input type="checkbox"/> Abate and control rodents as necessary to maintain performance of the facility <input type="checkbox"/> Drain standing water
Waste Disposal	Sediment, other pollutants, and all other waste shall be properly disposed of in a licensed landfill or by another appropriate disposal method in accordance with local, state, and federal regulations.



ATTACHMENT G

Engineer's Certification

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Certification

This Stormwater Management Plan (SWMP) has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based. The plans and specifications in this SWMP are not for construction purposes; the contractor shall refer to final approved construction documents for plans and specifications.

A handwritten signature in blue ink that reads "Brian Oliver".

Brian K. Oliver
RCE 60627

A handwritten date in blue ink that reads "4/26/07".

April 2007



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RBF JN 25-100796

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9755 Clairemont Mesa Blvd., Suite 100 • San Diego, California 92124-1324 • 858.614.5000 • FAX 858.614.5001
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